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Cincom eyes new 2-phase commit plan

By Wayne Eckerson
Senior Editor

CINCINNATI — Cincom Systems, Inc. hopes to make a big splash in the distributed database market when it announces a new two-phase commit technology that it says significantly improves transaction performance.

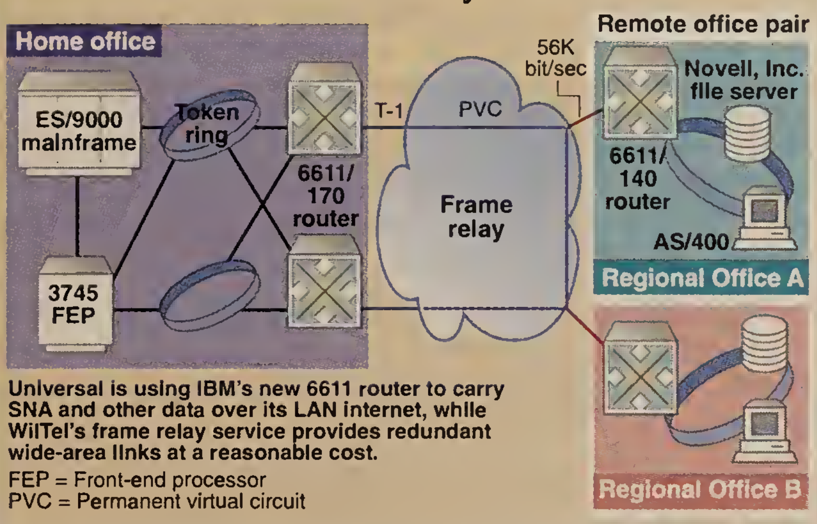
In March, Cincom will unveil Transaction Partners, a peer-to-peer two-phase commit protocol that has been in development for eight years and is patented by the firm, officials said. The new technology will let companies achieve a higher throughput of completed transactions while keeping distributed databases in sync.

Analysts and users said they have high regard for the new technology, which is currently in beta test and will be incorporated in a future release of the firm's Supra Server SQL database, which first shipped last month.

The Transaction Partners protocol enables applications to complete a transaction even if one or more databases are unavailable to execute the update. It abides by the principle that if one

(continued on page 8)

IBM router + frame relay = redundant net



Universal is using IBM's new 6611 router to carry SNA and other data over its LAN internet, while WilTel's frame relay service provides redundant wide-area links at a reasonable cost.
FEP = Front-end processor
PVC = Permanent virtual circuit

GRAPHIC BY SUSAN SLATER SOURCE: UNIVERSAL UNDERWRITERS GROUP, OVERLAND PARK, KAN.

Early user matches IBM router with frame relay

By Skip MacAskill
Staff Writer

OVERLAND PARK, Kan. — IBM's router combined with WilTel's frame relay service adds up to a reliable, cost-effective means of supporting SNA and other protocols, according to the Universal Underwriters Group insurance company here.

The firm, one of the first to employ IBM's new 6611 Network Processor, has made the router a linchpin in its network upgrade plan. That plan includes the use of WilTel's WilPak frame relay service to increase network capacity, add redundancy and position the company to take advantage of future packet-based services.

"The bottom line was to plan for the future and enhance our service offerings to users at remote sites," said Rene Pfluger, senior product manager at Zurich Holding Company of America, Inc., Universal Underwriters' parent company.

Universal Underwriters' new network, dubbed Net 2000, will replace a Systems Network Architecture net of 14.4K bit/sec mul-

(continued on page 8)

Proteon details new SNA priority scheme

Routing feature enables users to give SNA sway without shutting out local-area net, other traffic.

By Maureen Molloy
Senior Writer

WESTBOROUGH, Mass. — Proteon, Inc. is upping the ante in the SNA game with new software features for its router that promise to improve its performance in shipping SNA and other protocols across multiprotocol internets.

Proteon said it will announce this week new Internetworking Traffic Management (ITM) software that offers improved support for critical IBM Systems Network Architecture data without adversely affecting the performance of lower priority data.

ITM, expected to be available next month free of charge to existing customers, lets users assign up to 40 priority levels for different types of data and applications, each of which is guaranteed access to bandwidth.

Proteon will also announce other SNA routing enhancements, including a Network Basic I/O System filtering scheme and a new module for its high-end CNX 500 router that will enable it to better support legacy IBM Synchronous Data Link Control devices.

The features will add to the vendor's current support for SNA

(continued on page 7)

INSIDE

BUYER'S GUIDE

- ATM and fast Ethernet don't yet match FDDI on price, performance. Page 49.

Sprint slips 800 feature in past AT&T

By Bob Wallace
Senior Editor

WASHINGTON, D.C. — Sprint Corp. last week leapfrogged AT&T by making available a new enhanced 800 feature that enables users to access its signaling network to reroute calls among multiple call centers.

With Sprint Interface To an External Routing Processor (SiteRP), customers use an on-site processor — a minicomputer or mainframe — to give Sprint call-by-call instructions on how to route 800 traffic.

SiteRP is available now and carries no charge for rerouting calls. With AT&T's recently announced Intelligent Call Processor (ICP) — which will be available Dec. 31 — each call costs between 3 and 5 cents to route.

Although AT&T claimed two weeks ago that its ICP offering was an industry first, it is Sprint

(continued on page 69)

NETLINE

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DEC TO ICE PHASE IV next year, force users to Advantage Networks. Page 2.

SIKES RESIGNS FCC, making way for Democrats. Plesser may lead transition. Page 2.

IBM LAN-TO-HOST link enhanced to support TCP/IP, file transfers with NetWare. Page 2.

CSC PRODUCT SPEEDS projects by integrating off-the-shelf wares, work group software. Page 4.

START-UP TO OFFER utility that helps programmers link distributed object-oriented programs. Page 4.

SMC MOVES TOWARD Sigma acquisition with an eye on the emerging switching hub mart. Page 4.

NEWSPAPER

Users, carriers engage in frame relay SVC tug-of-war

By Bob Brown and Bob Wallace
Network World Staff

The outcome of a growing squabble between users and carriers over deployment of frame relay switched virtual circuits (SVC) could determine how successful public frame relay services will ultimately be.

Carriers claim there is no user demand for SVCs, so they are in no hurry to deploy the service. Users disagree, saying it would be a cost-effective way to provide redundancy and tie smaller sites into corporate networks.

"We'd absolutely find uses for SVCs," said John Matthesen, corporate director of telecommunications at Sybase, Inc., an Emeryville, Calif., software vendor with a 23-node WilTel WilPak frame relay net. "It's something we dream about for sites that don't need a full-time connection, and it might be interesting to use [for redundancy]."

Frame relay users today have to use permanent virtual circuits (PVC) — essentially dedicated paths between switches in carrier nets — the cost of which has put the service out of the reach of those with moderate traffic loads.

In contrast, SVCs let users establish switched connections between nodes and pay according to usage. "SVCs are critical to the future of frame relay," said Alan Taffel, president of the Frame Relay Forum, a vendor group that

(continued on page 68)

DEC phasing out Phase IV, enhancing its DECnet/OSI

Vendor expected to better integrate TCP/IP into DECnet/OSI component of Advantage Networks.

By Jim Duffy
Senior Editor

LAS VEGAS — Opting not to gamble on disruptive surprises, Digital Equipment Corp. last week laid down its cards on DECnet's future at the DEC User Society (DECUS) Fall '92 Symposium here.

Included in DEC's hand was the disclosure that shipments and support of DECnet Phase IV will cease as of mid-1995. DEC also said it is looking to better integrate Transmission Control Protocol/Internet Protocol into the DECnet/OSI component of Advantage Networks, the successor to DECnet Phase IV, and that it will add Open Systems Interconnection X.500 directory services to DECnet/OSI next year.

The VMS version of DECnet Phase IV, called DECnet-VAX, will be upgraded two more times before it is retired in mid-1995, said Robert Segrest, DEC director of network development for federal science and research.

An enhanced version of DECnet-VAX is planned for mid-1993, concurrent with a new version of the OpenVMS operating system, Segrest said. The final release will be delivered in mid-1994

(continued on page 6)

FCC chief Sikes resigns, makes way for Democrats

Departure marks end of 12-year Republican rule.

By Ellen Messmer
Senior Correspondent

WASHINGTON, D.C. — In the wake of the Republican presidential defeat in November, Federal Communications Commission Chairman Alfred Sikes last week resigned his post to make way for the Democratic transition.

The day before President-Elect Bill Clinton's inauguration, Sikes will exit as chairman, handing off responsibility for crucial decisions on such issues as wireless personal communications services (PCS) to an as yet unknown Democratic appointee.

Sikes' departure in January will mark the end of 12 years of Republican control of the FCC, where a philosophy of competition through deregulation prevailed. Prior to his role at the FCC, Sikes was the assistant secretary of commerce and administrator of the National Telecommunications and Information Admistration.

That philosophy — which led to AT&T's divestiture, decisions to loosen regulation of AT&T, price cap regulation for AT&T and the regional Bell holding companies, and the unbundling and tariffing of local exchange

(continued on page 68)

IBM releases new version of LAN-to-host software

By Caryn Gillooly
Senior Editor

WHITE PLAINS, N.Y. — IBM last week introduced new versions of its LAN-to-host software that add support for TCP/IP and file-transfer capabilities with Novell, Inc. NetWare nets.

LAN Resource Extension and Services (RES)/MVS and LANRES/VM are software packages that let IBM MVS- and VM-based System/390 mainframes act as additional resources to Novell NetWare 3.X local-area network servers.

With the new release, LANRES/MVS Version 1.2 has been enhanced to include the functionality previously available only with LANRES/VM, including print services and central LAN administration. In addition, Version 1.2 of LANRES/VM and LANRES/MVS now provide disk services and file-transfer capabilities between NetWare and IBM systems.

Both new versions also now let NetWare and IBM systems communicate over a Transmission Control Protocol/Internet Protocol or Systems Network Architecture link and support Novell's NetWare for SAA LAN-to-host gateway to provide the link

(continued on page 69)

Briefs

UnixWare hits the streets. Univel, the partnership company between Novell, Inc. and Unix System Laboratories, Inc., last week began shipping UnixWare, its NetWare-ready Unix operating system. The firm is shipping a single-user version for $495 and a server version, which provides distributed multiuser access to Unix applications, for $2,495. An application development kit costs $995. Gupta Technologies, Inc., Informix Software, Inc., Ingres Corp., NetFRAME Systems, Inc., Oracle Corp., Proteon, Inc., WordPerfect Corp. and others have announced product support for the new operating system.

From the rumor mill . . . Apple Computer, Inc. declined to comment on rumors that it was discussing an acquisition of Novell, Inc., and Novell denied the rumor. Likewise, AT&T and the Canadian carrier Unitel Communications, Inc. declined comment on a published report that said AT&T is planning to acquire a 20% stake in the carrier.

DEC demos new Pathworks. At a user group meeting in Las Vegas last week, Digital Equipment Corp. demonstrated Pathworks for Windows NT, a version of its local-area network operating system for Microsoft Corp. Windows NT client and servers. Expected to ship next spring, the product will support Fiber Distributed Data Interface, DECnet Phase IV end-node and Local Area Transport protocols, synchronous and asynchronous communications for accessing remote sites, and binary compatibility with Pathworks Windows/DOS. It will also support the Open Software Foundation, Inc.'s Distributed Computing Environment Remote Procedure Call application program interface.

Unix International declares war on Microsoft. Unix International, Inc. last week issued a study of Unix vs. Microsoft Corp.'s Windows NT that praises Unix and discredits Windows NT. The report highlights the networking capabilities, reliability and cost competitiveness of Unix, and gives Microsoft credit for only a strong marketing and sales organization. David Thacher, Microsoft's group product manager for Windows NT, said his company does not consider Windows NT to be at war with Unix but is, instead, designed to work with Unix. To obtain a copy of the study, call (201) 263-8400, Ext. 500.

FDDI-over-UTP standard delayed again. Hopes of finalizing the standard for running 100M bit/sec Fiber Distributed Data Interface over unsheilded twisted pair were dashed at last week's ANSI TP-PMD working group meeting in San Diego when test data showed that versions of the standard under consideration failed to pass the Federal Communications Commission's electromagnetic susceptibility tests. SynOptics Communications, Inc. presented data on a high-level signal that would meet those requirements, and the merits of that proposal will be debated and possibly voted on at the next meeting in February.

Borland to slim down. Borland International, Inc., a Scotts Valley, Calif., database vendor, last week announced a corporate restructuring that will result in layoffs of 350 people — about 15% of the company's work force — and a charge of as much as $35 million against fiscal third-quarter earnings. Philippe Kahn, Borland's chairman, president and chief executive officer, said the restructuring is the result of price competition in the industry and the need to make Borland "leaner, more competitive and profitable." Observers said Borland has not totally recovered from its acquisition of Ashton-Tate Corp. and has been hurt by product delays.

CONTACTS

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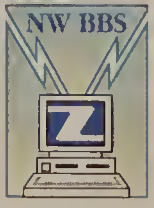

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CONTENTS

Data Net Architectures 9
NIST explains GOSIP procurement rules.
Harris delivers controllers to integrate SNA, TCP/IP.

Local Networking 17
Apple readies attack on enterprise front.
SCO unveils LAN Mgr. for Windows for Workgroups.

Internetworks 23
Northrop deploys dual-homed FDDI net.
Hadax adds built-in mgmt. station to its MAU series.

Global Services 29
Sprint freezes plans for Multirate ISDN.
Users push FCC to cross another portability hurdle.

Enterprise Applications 35
Replication, naming added to NetWeave.
DG offers electronic mail, groupware for WordPerfect.

Industry Update 39
Transarc and Retix push for open OLTP.
X/Open draws up 1993 interoperability road map.

Management Strategies 41
A look at mail-enabled applications.
Net managers, software engineers in high demand.

Opinions 44

Features 49

Action Center 60

Networking Marketplace 65

Networking Careers 67

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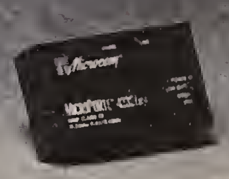

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Circle Reader Service #31

CSC releases Unix-based system based on DOD CALS

Cuts paper trail, automates work flow processes.

By Timothy O'Brien
West Coast Bureau Chief

EL SEGUNDO, Calif. — Computer Sciences Corp. (CSC) last week announced a Unix-based information management system that provides integrated work flow and distributed database capabilities.

The product, called Enterprise CALS (ECALS), is designed to enable users to simplify and speed projects by reducing dependence on paper and automating work flow processes.

To create ECALS, CSC developed the work flow component and interface software needed to integrate more than 40 off-the-shelf packages in the areas of imaging, communications and database, the most notable of which is Oracle Corp.'s database management system.

"By being able to merge not just data and documents, but applications needed to accomplish entire processes, ECALS promises to drive rapid business process reengineering," said Jim Saviano, chairman of CSC's commercial systems integration business.

Despite the use of automation in organizations today, CSC said large volumes of paper are produced at each step, from the design of a product, the buying of parts to build it, the mapping of processes to produce it and the documentation of steps to repair and maintain it.

CSC hopes ECALS will reduce that paper trail by making much of this information available electronically and by automating many of the collaborative functions involved in these tasks.

Although the software is expected to be ported to different operating environments next year, it will initially be based on a client/server architecture that supports Digital Equipment Corp.'s Ultrix operating system at the server and the Open Software Foundation, Inc.'s Motif at the client.

The system supports the Transmission Control Protocol/Internet Protocol for use over networks.

CSC said other target Unix environments include Hewlett-Packard Co.'s HP-UX, IBM's AIX and Sun Microsystems, Inc.'s SunOS. Additional database systems to be supported include Informix Software, Inc.'s OnLine and Sybase, Inc.'s SQL Server.

In terms of desktop support, CSC acknowledged the need to support Microsoft Corp.'s Windows. It plans on completing that work by the end of 1993.

To support the many different data formats, applications and operating environments, CSC has provided interface software that enables users to locate information without knowing specific commands, languages or database structures. As a result, users will be able to access and share data that is stored on different systems, in different formats and in different locations.

ECALS also takes advantage of any gateways or utilities that come with off-the-shelf packages, which would include all the SQL and communications gateways provided by Oracle.

The technology that drives ECALS is based on the Computer-Aided Logistics Support (CALS) initiative, which was launched by the Department of Defense in 1985. CALS requires all suppliers to the Defense Department to conform to CALS standards, making it possible to electronically exchange documents, billing data and other information.

Firm to offer utility to tie object-oriented applications

By Wayne Eckerson
Senior Editor

MOUNTAIN VIEW, Calif. — IntelliCorp plans to announce soon a communications utility that will enable developers to efficiently link pieces of an object-oriented application spread across multiple, heterogeneous computing platforms.

Called Kappa CommManager, the utility will manage communications between objects located on different nodes within Transmission Control Protocol/Internet Protocol networks. It shields developers from the network complexities involved in tying together distributed object-oriented applications.

Kappa CommManager handles communications within and between applications built using IntelliCorp's ProKappa 2.1 and Kappa PC client/server development tools, which run on Unix and DOS/Windows platforms, respectively. The software resides on all nodes in a network that support ProKappa or Kappa PC applications.

The Kappa CommManager utility, which will be announced in January and shipped by the end of next quarter, functions as a distributed object repository containing the addresses of each object on the network and information about how to access those objects. It allows application objects to interact in real time across a TCP/IP network.

Objects are pieces of data and code that represent components of an application or business operation.

Kappa CommManager allows ProKappa developers to divide parts of an application — such as the graphical user interface, application logic, screen logic and data access elements — so that they run on different Unix and personal computer nodes in a TCP/IP net. This gives developers greater flexibility in building applications that satisfy end-user performance requirements and corporate data architectures, said Jim Sterne, senior product manager at IntelliCorp here.

A second release of Kappa CommManager, due out by the end of 1993, will add support for CICS applications on MVS hosts via LU 6.2 sessions, Sterne said.

The next release will also dynamically recompile application code on other processors in the network, improving application performance by distributing processing chores on the fly to the first available processor. The initial release of Kappa CommManager requires a programmer to recompile the code manually.

The next version of Kappa CommManager will also support the Common Object Request Broker Architecture, a specification for standardizing the way applications locate and invoke objects distributed across a network.

Correction: The article "3Com to roll out low-end SNA-ready Ethernet hub" (*NW,* Dec. 7) incorrectly stated that 3Com Corp. plans to deliver a 10Base-T hub supporting its Boundary Node System Architecture as well as Synchronous Data Link Control conversion capabilities. The Boundary Node functionality will be offered in future routers, which may eventually be integrated with hubs, but 3Com said it has no plans to support the architecture in a 10Base-T hub (see "3Com unveils new routing pack for remote devices," page 23).

Sigma buyout moves SMC into switching hub mart

By Bob Brown
Senior Editor

HAUPPAUGE, N.Y. — Standard Microsystems Corp. (SMC) last week said it plans to buy Sigma Network Systems, Inc., a move that will expand SMC's internetworking portfolio and give it a foothold in the emerging switching hub market.

SMC, based here, is a vendor of local-area network adapter cards and Ethernet hubs. Sigma, based in Reading, Mass., sells switching hubs with integrated bridging, routing and hub capabilities.

The transaction, which will be executed via a stock swap valued at about $9 million, comes at a busy time for both companies.

SMC will unveil at NetWorld 93 Boston in January an intelligent token-ring media access unit and a token-ring hub card for personal computers that complies with Novell, Inc.'s Hub Management Interface. The vendor will also announce next year an Ethernet hub card that adheres to Novell's Hub Management Interface.

The company plans to move forward with new products currently in the works at Sigma, which will give up its name once the acquisition goes through.

At INTEROP 93 Spring, SMC will introduce a High Speed Serial Interface for its newly acquired Sigma hub that will support up to T-3 speed. That hub is now called the Enterprise Communications Server/1 but will probably be renamed.

SMC plans to provide Apple Computer, Inc. AppleTalk, Digital Equipment Corp. DECnet, Novell Internetwork Packet Exchange (IPX) and Xerox Corp. Xerox Network Systems protocol routing on the hub. It is also promising a possible industry first — an integrated switching capability that will give users 16M bit/sec token ring to the desktop.

The acquisition will broaden SMC's product line and strengthen its position against other

(continued on page 69)

IBM preps peer-to-peer line for '93

By Michael Cooney
Senior Editor

SAN FRANCISCO — IBM last week revealed more evidence that 1993 will be a banner year for its peer-to-peer networking product line.

At the APPC Developer's Conference here, IBM executives said users will see more versatile versions of the firm's Common Programming Interface for Communications (CPI-C) next year, along with improved protocol support and other enhancements designed to help bring users into the Advanced Peer-to-Peer Networking (APPN) fold.

CPI-C is IBM's high-level application interface to underlying LU 6.2 data transport protocols. Together, CPI-C and IBM's LU 6.2 protocol support peer-to-peer application services and synchronize program processing between distributed platforms. LU 6.2 is also the key transport protocol in IBM's APPN technology for creating dynamic peer-to-peer nets.

"IBM will be optimizing CPI-C and LU 6.2 in preparation for APPN and will show why those technologies are the primary tools to build new SNA environments," said John Pickens, director of communications architec-

(continued on page 6)

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DEC phasing out Phase IV

continued from page 2

with another OpenVMS update, he said. After that, DECnet-VAX patch kits will be available until mid-1995, at which time product support will expire, he added.

"This is a substantial enough transition for our major network clients that we really had to let them know what was going on," Segrest said.

DECnet Phase IV for OpenVMS AXP — the version of VMS for DEC's new Alpha platform — will ship until the end of 1993, with support extending through mid-1994, according to Segrest. And support for DECnet-Ultrix, the Phase IV implementation for DEC's Unix variant, will cease in mid-1993. The DECnet-Ultrix product has already been pulled from the market.

The phaseout of DECnet-VAX may strand DEC's vast installed base of Phase IV users that do not plan to migrate to DECnet/OSI. According to International Data Corp. (IDC), a market research firm in Framingham, Mass., the installed base of minicomputer systems running Phase IV will total 294,000 nodes this year.

"There aren't going to be a lot of happy customers," said IDC analyst Rick Villars, referring to Phase IV's expiration.

Indeed, many users are not jumping on the DECnet/OSI bandwagon ("Fishing for takers," *NW,* Dec. 7).

Those that are, however, said the two-year phaseout of DECnet Phase IV will not be disruptive. "Based on what I've heard on the preparation work [for migrating to DECnet/OSI], I perceive it's not a problem for our organization," said Donald Mattes, systems architect for SmithKline Beecham Corp., King of Prussia, Pa.

Segrest also revealed that DEC plans to better integrate layers of the TCP/IP protocol stack with the DECnet/OSI stack, a project that is consistent with the Internet Request for Comment 1006 proposal to support OSI applications over TCP/IP. DEC's intent is to give users the option of employing the IP stack to access OSI applications, something they cannot currently do with DEC's Advantage Networks product suite.

Advantage Networks includes an integrated DECnet and OSI protocol stack and a parallel TCP/IP stack.

DEC has been scurrying in the past two years to include TCP/IP with DECnet/OSI, prompting a change in the product name from DECnet Phase V to Advantage Networks.

While better TCP/IP integration is forthcoming, DEC is also continuing to enhance the OSI capabilities of Advantage Networks and will, next year, add X.500 directory services. X.500 is intended to foster interoperability among the directories of separate networks so destination nodes can be located easily.

IBM preps '93 peer-to-peer line

continued from page 4

ture for 3Com Corp. in Santa Clara, Calif. "These products will be the train into the future."

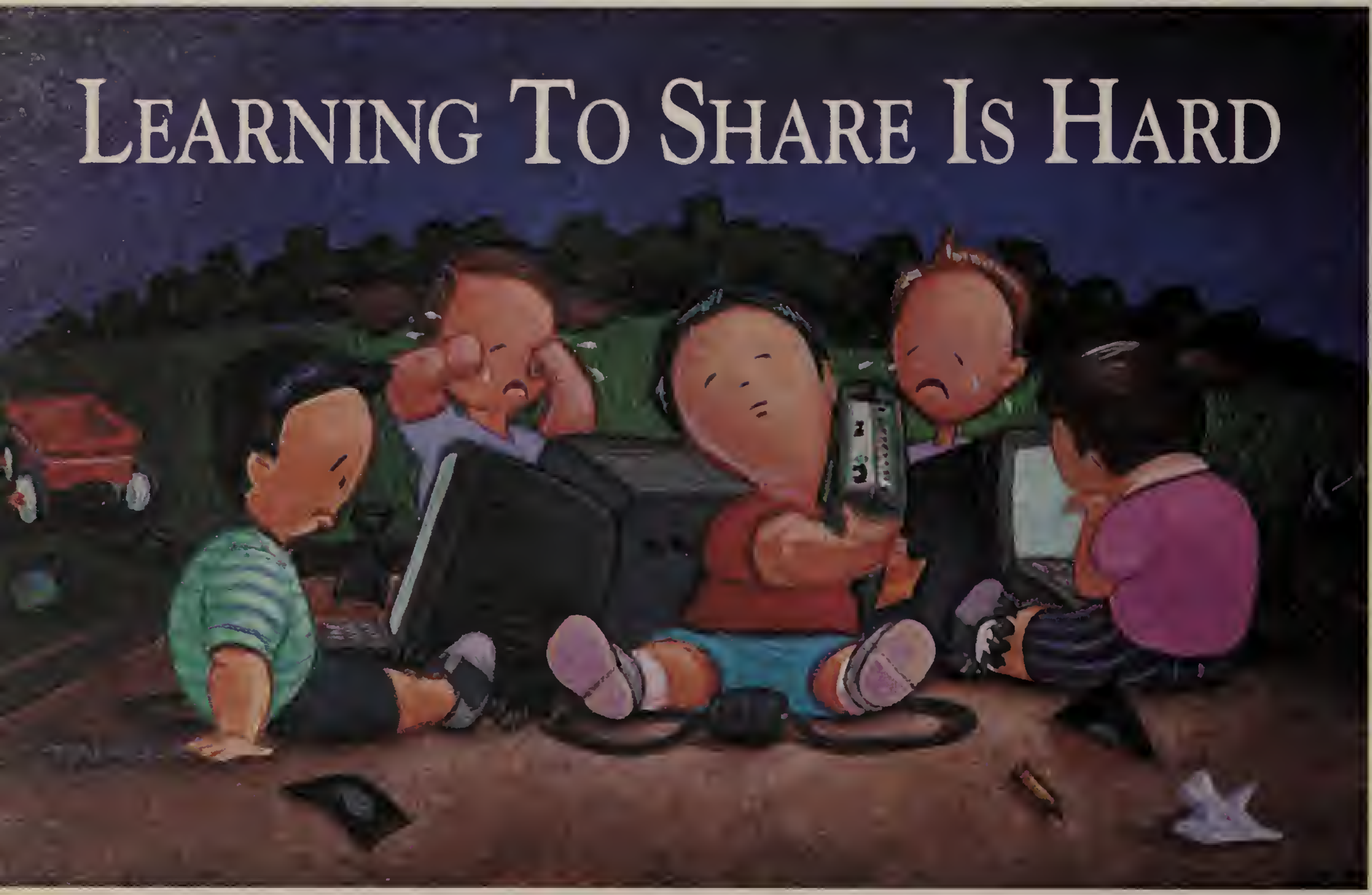
To facilitate CPI-C's growth and acceptance, IBM and key CPI-C vendors and users, such as Eicon Technology Corp., Apple Computer, Inc. and Boeing Computer Services, have formed a CPI-C Implementors Workshop (CIW). The group's first meeting was held Dec. 1-4 in Raleigh, N.C.

IBM said the CIW had helped shape the final features included in CPI-C Level 1.2, which is now ready to be implemented in products. Those features include letting CPI-C applications accept multiple incoming application conversations, data conversion from EBCDIC character sets to ASCII and basic security features such as passwords.

The CIW also established 10 special interest groups to develop and prioritize the list of features IBM will ultimately include in CPI-C 2.0, expected by the end of 1993. That list includes better support for servers, improved distribution service capabilities and increased multiprotocol support.

Increased server support will come in the form of full-duplex LU 6.2 sessions between nodes and specific address support, which lets users set specific data paths for communications between only certain designated Advanced Program-to-Program Communications nodes. Today, LU 6.2 supports half-duplex or one-way application communications and does not let users designate APPC nodes with which to communicate.

Also scheduled to be supported is distributed directory functions that would let a CPI-C application user communicate with other CPI-C users without having to know where they are located on the net. CPI-C Level 2.0 will also go beyond LU 6.2 protocols and let applications run over Open Systems Interconnection or Transmission Control Protocol/Internet Protocol networks.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Circle Reader Service #32

Proteon to unwrap new priority scheme

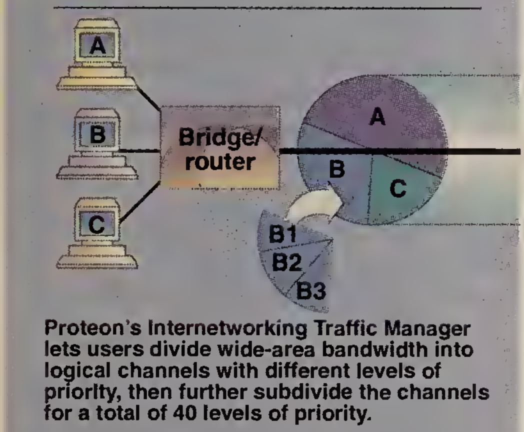
continued from page 1

encapsulation, SDLC-to-Logical Link Control conversion and IBM's LAN Network Manager and NetView network management systems.

Michael Howard, president of Infonetics Research, Inc., a San Jose, Calif.-based consultancy, said Proteon's ITM is a flexible approach that offers a more detailed level of prioritization than those espoused by vendors such as Cisco Systems, Inc., CrossComm Corp. and Wellfleet Communications, Inc., all of which announced SNA prioritization schemes earlier this fall. ITM gives SNA the deterministic response times it requires but with less risk of timing out lower priority sessions.

"It takes into account pragmatic, real-world network conditions. There is a deep concern about making internets reliable for SNA, but internets must also be made reliable for multiple protocols," Howard said. "This is where Proteon has come into the second wave of the SNA prioritization arena and one-upped the other vendors."

Proteon sets priorities



Proteon's Internetworking Traffic Manager lets users divide wide-area bandwidth into logical channels with different levels of priority, then further subdivide the channels for a total of 40 levels of priority.

SOURCE: PROTEON, INC., WESTBOROUGH, MASS.
GRAPHIC BY TERRI MITCHELL

According to Paul Toldalagi, Proteon's vice-president of business development, the key component of ITM is its Bandwidth Reservation feature. It guarantees that no one type of traffic can block transmission of any other. "In many networks, lower priority traffic can be completely barred from the wide-area link if there's significant high-priority traffic traversing the net and hogging all the bandwidth," he said.

Bandwidth Reservation allows users to split wide-area bandwidth into four logical channels, each with a different level of priority — urgent, high, normal and low. These can then be further broken down into 10 subchannels for a total of 40 priority levels (see graphic, this page).

Users can specify how much bandwidth is allocated to each channel. For instance, high-priority SNA traffic can be given 50% of the bandwidth, while normal and low traffic are assigned the remaining 50%. Once a session is complete, the bandwidth allocated for that session is automatically distributed evenly among active sessions.

With other vendors' priority schemes, all of the highest priority traffic is transmitted before any data in the next priority level, Toldalagi said.

ITM lets users prioritize traffic according to various parameters, including protocol — be it SNA or any other — port number, packet size and application, such as net management data.

"When the network is really disruptive, that is precisely when you don't want a file transfer to be given precedence over packets carrying SNMP alerts, for example," Toldalagi said.

The software also enables the user to place different priority schemes on each link within the internet, so a packet's priority may change as it passes through different routers.

This myriad of prioritization options does require more configuration on the part of the user, a process that could take anywhere from several hours to several days, according to Proteon. Users will need to monitor traffic patterns and make appropriate changes to each parameter.

Other enhancements

Proteon is also announcing and shipping next month software that enables IBM Network Basic I/O System traffic to be more efficiently transported through internets. The software enables Proteon routers to learn the location of remote nodes and forward packets on a targeted basis instead of broadcasting them to all nodes.

This cuts costs and improves performance because it reduces the amount of traffic flowing over the wide-area links.

Proteon will also announce this week the CNX Quad WAN Network Interface Card for its CNX 500 router. The offering enables a single router card to support four serial lines of up to T-1 speeds.

The card supports both data encoding schemes used by IBM cluster controllers to derive clocking information — Non-Return to Zero and Non-Return to Zero, Inverted. It also supports half-duplex operation, which enables it to handle older controllers. ◼

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Circle Reader Service #39

User matches router with frame relay

continued from page 1

tidrop analog leased lines that connect IBM Application System/400s in 24 regional offices to an IBM ES/9000 mainframe here.

Although not scheduled for completion until mid-February, the net is already showing impressive results. Net 2000 sites are hitting the target three-second response time more than 95% of the time, up from 75% under the old configuration, said Wayne Wilson, the company's teleprocessing manager. Response times between 1.5 and 2 seconds are becoming the norm, and those figures are expected to improve as the network is tuned.

Net 2000 is anchored by two seven-slot 6611 Model 170 routers at the main office here, each of which will ultimately support frame relay links to 12 four-slot 6611 Model 140 routers in remote regional offices (see graphic, page 1).

The routers support new Novell, Inc. NetWare token-ring local-area networks being installed at remote sites as part of a long-term downsizing plan.

The network will be managed using IBM's SystemView NetView/6000 net management system, which uses the Transmission Control Protocol/Internet Protocol as a transport protocol.

"Since the majority of our traffic will still be SNA, we needed a router that could handle that, as well as the [Novell] IPX and TCP/IP traffic," Pfluger said. "We were impressed with IBM's service, support, the router's ease of configuration and the fact it could be managed via NetView/6000 and support other protocols."

The 6611 uses IBM's Data Link Swit ing (DLS) architecture, which conve SNA traffic into TCP/IP frames and e ploys the Open Shortest Path First protocol to route the traffic through the network. DLS helped the router fulfill Universal Underwriters' requirement for a device that could keep SNA sessions active even if the session must be rerouted.

The 6611 was also a good fit because it could support frame relay, which Universal Underwriters chose instead of dedicated 19.2K and 56K bit/sec leased lines. Frame relay offers an easier migration path to Asynchronous Transfer Mode services, cost-effective disaster recovery features and better performance than the alternatives, Pfluger said.

In the new net, 56K bit/sec local access lines will link the remote sites into WilTel's nationwide frame relay net. Frame relay 56K bit/sec permanent virtual circuits (PVC) connect each site to one of the two 6611s at the main office, which is tied to WilPack via T-1 access lines. The two headquarters' routers each have two token-ring links to the front-end processor, providing an alternate path to the mainframe.

Furthermore, the regional offices are grouped into a dozen pairs. The two sites in each pair link to different routers at headquarters and to each other via PVCs, giving all sites an alternate route to the host.

Because multiple remote locations can be reached via a single link to a frame relay net, Universal Underwriters needs only the two routers at the main office.

"A point-to-point leased-line approach would have required at least five routers at the home office because of the number of access ports required," Pfluger said.

The ALM 3226, the new fax-cellular-data portable modem from Racal-Datacom, is proof positive that good things come in small packages. Here's why:

- The only portable modem that operates over standard phone and cellular lines, and provides 14.4 Kbps facsimile capabilities
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The ALM 3226 connecting a laptop to a cellular phone. (Approximate size is 1" X 2½" X 5¼")

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Circle Reader Service #42

Cincom eyes 2-phase commit plan

continued from page 1

commit succeeds, they all succeed.

In contrast, two-phase commit protocols employed by other database vendors force a transaction to roll back and start again if even a single node is unable to perform the update. So, if one commit fails, they all fail.

"We feel Transaction Partners will give us a competitive advantage," said Marco Emrich, director of system software products and architecture at Cincom.

Some users are eagerly awaiting the arrival of Transaction Partners. GE Capital Mortgage Corp. in Raleigh, N.C., needs to distribute data among more than 30 locations and is evaluating distributed databases from Cincom, Ingres Corp., IBM, Oracle Corp. and Sybase, Inc.

"So far, Supra Server is at the top of our list," said Robert McKeown, vice-president of corporate technical development at GE Capital. "It's the only database that can address our [distributed database] needs today, not sometime in the future."

Shaku Atre, a specialist in distributed database technology based in Rye, N.Y., said, "Transaction Partners is superior to two-phase commit because it provides better performance and ensures higher availability of database resources."

With traditional two-phase commit, a failure at one node often locks records in multiple databases until the failed node

(continued on page 69)

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4. Purchase influence/number of sites
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> "LU 6.2 took so long to get into the marketplace, it lost its momentum to become *the* standard for data communications. Now it's part of a family of communications protocols users can choose from."
>
> **Keith Eisenstark**
> Director of architecture and planning of X.Com software
> Legent Corp.
> Vienna, Va.

Data Packets

Candle Corp. of Los Angeles last week announced enhancements to its Omegamon II for MVS and IMS performance monitoring products.

Omegamon II for MVS Version 200 can now provide real-time and historical performance monitoring of mainframe application cache usage. It can also pinpoint wasted storage space or inefficient use of direct-access storage devices.

Omegamon II for IMS Version 110 includes a Transaction Reporting Facility that provides information on the resources used by an IMS application for capacity planners, performance analysts, database administrators and programmers.

Candle also announced Shared Consolidated Software Inventory (CSI) support for all of its OmegaCenter enterprise systems management products. CSI lets users collect detailed systems management data throughout the enterprise and display it graphically on a single Omegamon monitor. In the past, multiple monitors were required.

Pricing and availability were unannounced.

(continued on page 12)

Harris delivers controllers to integrate SNA, TCP/IP

Suite offers users more net configuration options.

By Michael Cooney
Senior Editor

CARROLLTON, Texas — Harris Adacom Network Services, Inc. last week rolled out a suite of communications controllers designed to integrate Systems Network Architecture and Transmission Control Protocol/Internet Protocol networks.

The new Internetwork Controller System (ICS) family will ultimately comprise five models that will give SNA-TCP/IP users more network configuration options while giving personal computers and 3270 terminals access to both SNA and TCP/IP host-based applications.

The Reduced Instruction Set Computing-based ICS controllers run the Unix software and the proprietary ICS software that can convert SNA protocols to TCP/IP or TCP/IP protocols to SNA. This lets users on either network communicate with hosts on the other and also lets users employ a single backbone to carry both types of traffic.

To the SNA net host, the ICS controller appears as a PU 2.0 or 2.1 device, such as a 3174 controller or an Application System/400. To a TCP/IP host, the ICS controller appears as a native TCP/IP network node.

The ICS controllers support SNA LU 6.2 for PC communications with the IBM host, tn3270 or 5250 protocols for communicating with IBM mainframes and mid-ranges, respectively, and TCP/IP Telnet for TCP/IP terminal-to-host communications. The controllers also support the TCP/IP File Transfer Protocol.

The ICS Model 1 can support 64 SNA mainframe sessions over one Synchronous Data Link Control line at up to 19.2K bit/sec and one Ethernet local-area network connection. The ICS Model 2 supports the same features plus one token-ring LAN connection.

(continued on page 12)

Wall Data jumps into DEC mart with Rumba pack

By Jim Duffy
Senior Editor

REDMOND, Wash. — Wall Data, Inc. last week made its first foray into the Digital Equipment Corp. market by unveiling Rumba for the VAX PC-to-host connectivity software.

Rumba for the VAX gives Microsoft Corp. Windows users access to data and applications on DEC VAX/VMS and Ultrix mid-range and mainframe-class systems. Until now, Wall Data provided software to connect Windows users to IBM mid-range and mainframe computers.

The new product lets a Windows-based personal computer emulate the full range of DEC VT terminals, said Michael Callahan, Wall Data's product marketing manager. The product supports DEC's Local Area Transport and Cterm terminal-emulation protocols, as well as the Transmission Control Protocol/Internet Protocol Telnet virtual terminal protocol for accessing Ultrix hosts.

Rumba for the VAX can be used concurrently with Wall Data's IBM-related software, Rumba for the AS/400 and Rumba for the Mainframe. This will provide users with simultaneous VAX, Application System/400 and mainframe access, plus a common user interface and application services, Callahan said.

Using local-area network bridges, routers and gateways, simultaneous access can be achieved even if the VAX and IBM hosts are on Ethernet and token-ring LANs, respectively, he said.

Rumba for the VAX software gives VAX applications the look and feel of Windows, according to Wall Data. Users can open as many VAX applications as their PC memory or interface will allow by clicking on a mouse.

Then, they can customize keyboards, cut and paste information between applications and perform other Windows functions with VAX applications, the company said.

With an installed base of

(continued on page 13)

GOSIP Register adds application products

December applications added to the Government Open Systems Interconnection Profile (GOSIP) Register

FTAM products	
HP FTAM/9000 Series 800	Hewlett-Packard Co.
NetWare FTAM Version 1.2 Revision B	Novell, Inc.
NCR OSI STAR PRO FTAM	NCR Corp.
DECnet-VAX Extensions Version 5.4A/VAX FTAM 2.0A	Digital Equipment Corp.
OSI-FTAM Release 2R1A	Unisys Corp.
EnComm FTAM Version 2.0.1	Encore Computer Corp.
FTAM for AViiON Systems Version 3.10	Data General Corp.
X.400 MHS products	
HP X.400/9000 HP OpenMail	HP
OS 1100 OSI-MHS Version OSI-HS 2R1B & 5R1A + PCR 987	Unisys
SUN NET MHS gateway Version 7.1	Sun Microsystems, Inc.
X.400 for AViiON Systems Release 3.10	DG

These products, operating over various subnetworks, have passed the GOSIP conformance tests required by the National Institute of Standards and Technology for federal procurement and are now on the GOSIP Register.

SOURCE: JOINT INTEROPERABILITY TEST CENTER, FT. HUACHUCA, ARIZ.

NIST explains GOSIP procurement rules

Spells out mandate requiring conformance testing, advises users to demand interoperability demos.

By Ellen Messmer
Senior Correspondent

GAITHERSBURG, Md. — The National Institute of Standards and Technology (NIST) last week told users they must require conformance tests in new Government Open Systems Interconnection Profile (GOSIP) procurements.

At a symposium held here to help federal users through the procurement maze, NIST officials emphasized that all new requests for proposal must require products to be tested for GOSIP conformance under federal guidelines. Although NIST will not require interoperability testing, officials advised users to demand in RFPs that vendors demonstrate product interoperability to achieve OSI-based communications across various agencies.

"Conformance testing is a mandate as far as the federal government is concerned," said Jean-Philippe Favreau, director of the U.S. GOSIP testing program. "Perhaps many vendors claim they are compliant, but check the [NIST] Register and you will see [which really are]."

Each type of product sold to the government under the GOSIP requirements must pass OSI conformance tests performed by one of the 14 accredited laboratories. The results of conformance tests are scrutinized by NIST's technical partner, the Joint Interoperability Test Center (JITC), a division of the Defense Information Systems Agency. Only products that pass inspection make it into the GOSIP Register, the list of federally recognized GOSIP-compliant products.

According to Favreau, about 50% of the products fail the JITC's test review. The high rejection rate — which he said often results from missing information — has fueled vendor resentment of the test program, with some claiming to spend half a million dollars for each product tested.

But Eva Kuiper, OSI consultant at Hewlett-Packard Co., said there are ways for vendors to reduce those costs. HP, for example, begins OSI conformance testing at the start of the product development cycle to avoid having programmers rewrite code at the end, she said.

Dozens of transport- and network-layer products have made it into the register since it was created two years ago, but until recently, HP had the only approved application-layer products. The updated list released by the JITC last week shows several new entries (see graphic, this page), including Unisys Corp. and Data General Corp.

However, weaknesses in test tools, or the sheer lack of them, continue to make testing difficult. Because of the lack of test systems for Virtual Terminal, Connectionless Transport and

(continued on page 12)

Others have made a career pricing their PCs under IBM.

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Model 425 SX *†Models 425 SX and 433 DX are shown with the PS/ValuePoint 6314 color monitor.*

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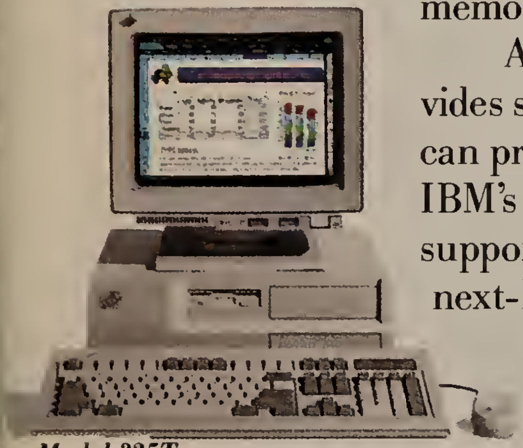

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Monitor	PS/2® 8511-VGA††	PS/ValuePoint 6312-SVGA	PS/ValuePoint 6312-SVGA
Memory/Storage	2MB RAM 80MB HD	8MB RAM 80MB HD	8MB RAM 120MB HD
Pre-installed Operating System	DOS 5.0	OS/2® 2.0	OS/2 2.0
Price†††	**$1,299**	**$1,629**	**$1,999**

††325T is SVGA-capable. †††IBM prices, dealer prices may vary.

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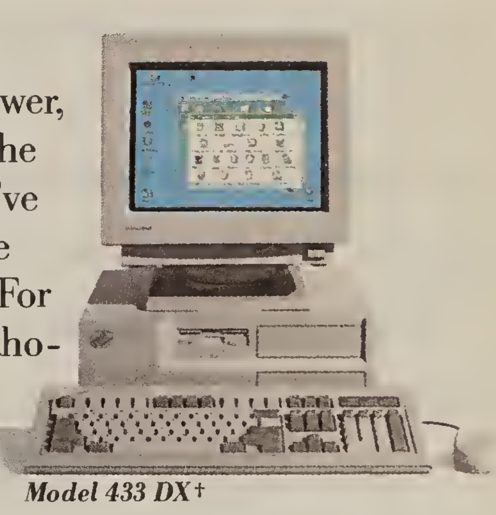

Model 433 DX†

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NIST explains GOSIP rules

continued from page 9

the Connection-Oriented Network Service, NIST has not set test requirements for those protocols. For the near term, NIST officials even suggested that agencies delay purchasing Virtual Terminal products or developing their own acceptance guidelines.

Weaknesses in the underlying abstract test suites for testing tools make conformance testing an imperfect art. U.S. companies, which have contributed little to the multimillion-dollar test suite development costs, rely on abstract test suites from the Open Systems Testing Consortium (OSTC), an organization funded largely by the European carriers.

NIST has concluded that the existing OSTC suites are imperfect and limited, covering, at most, 80% of any OSI standard specification.

"There were plenty of bugs in the test tools," said Favreau.

NIST, in an effort to improve quality, is now requiring all the test tool providers to report the type of bugs that were found in their tools and how they were eradicated.

But conformance testing, which indicates that a product adheres to a standard, does not guarantee interoperability because products are often implemented according to variations within the standard.

Allen Delehoy, a computer specialist with the U.S. Department of Agriculture, said it took more than six months for the department's staff to get FTAM products from IBM, The Wollongong Group, Inc. and DG to successfully interoperate due to a myriad of small differences.

"There are a lot of little holes," Delehoy said, adding that all three vendors were responsive in solving the problems. "They can claim compliance but not interoperability."

Requiring vendors to establish proof of interoperability in advance would spare users a lot of agony, Delehoy said. "Agencies shouldn't have to go through that," he noted.

Although it did not give official endorsements, NIST has determined that product interoperability tests established by the OSINET vendor consortium and the Brussels, Belgium-based Standards Promotion and Application Group (SPAG) constitute good benchmarks for users to reference when choosing products.

Harris integrates SNA, TCP/IP

continued from page 9

The ICS Model 3 can support up to 256 SNA sessions. It links to the mainframe via four 56K bit/sec SDLC lines or one 4M/16M bit/sec token ring and supports one local-area net connection, either Ethernet or token ring.

The Model 3 also supports TCP/IP tunneling, which lets it pass TCP/IP data over Advanced Peer-to-Peer Network nets by encapsulating the TCP/IP data in LU 6.2 protocols.

The ICS family will ultimately include Models 4 and 5, which will support more LAN and wide-area network connections, and perform faster than Models 1 through 3, but exact features for those boxes have not been determined yet, said Paul Sergeant, product manager for the ICS.

The new controllers extend, rather than replace, the firm's existing 9700 line of controllers.

The 9700 is a slower performing box with a proprietary operating system. For example, the slowest ICS Model 1 operates at 21 million instructions per second (MIPS), compared to the fastest 9700, which operates at about 10 to 15 MIPS, he said. Plus, the 9700 is linked directly to the mainframe channel, while the ICS passes data through the front-end processor.

"With the Unix operating system and the new hardware, users can expect a more expandable, better performing system," he said. "We expect the bigger ICS models to come in at the 60- to 70-MIPS range."

The new controller family will let users collapse their SNA nets onto a TCP/IP-based backbone and use the ICS controllers to avoid running separate TCP/IP and SNA nets. Or, using the Model 3 tunneling feature, users can link TCP/IP nets over their SNA backbone via LU 6.2, eliminating duplicate telephone lines.

The ICS controllers can be managed from IBM's NetView or any Simple Network Management Protocol system. Pricing starts at $13,500. Models 1, 2 and 3 are available now.

Data Packets

continued from page 9

Digital Communications Associates, Inc. of Alpharetta, Ga., last week announced new versions of its Irma Workstation for Windows (IWW) and DOS (IWD) PC-to-mainframe 3270-emulation products.

Both products, IWW Version 2.1 and IWD Version 2.0, now support non-DCA gateways, including Novell, Inc.'s NetWare for SAA.

DCA also added tn3270 support to both products, letting IWW and IWD users communicate with an IBM mainframe over a Transmission Control Protocol/Internet Protocol net.

The firm also added an on-screen bar of icons, known as Quickbar, to its IWW product that lets users click on features such as session activation/deactivation, and cut and paste among as many as five mainframe sessions on their IWW workstation.

DCA also added a graphical keyboard editor to its IWD product, making it easier for users to remap their keyboards for different 3270 applications.

IWW is available now for $495, while IWD will be available in January for $423.

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NetTech bolsters NetView with bevy of mgmt. tools

By Michael Cooney
Senior Editor

RALEIGH, N.C. — Increasing NetView operator productivity while decreasing operating costs is the goal of new NetView network management tools announced last week by software developer NetTech, Inc.

The firm's new EView family of NetView management tools are designed to beef up NetView's performance by providing automated responses to net alerts and eliminating duplicate alarms that chew up mainframe CPU cycles and NetView operator time.

EView is a family of five software tools that run on top of IBM's host-based NetView net management platform and let users build a variety of features that make NetView more efficient.

The tools expand on and are more efficient than the EView tools announced earlier this year, said Duncan Hare, vice-president of marketing for NetTech (“NetTech's first tools to enhance NetView,'' *NW,* Jan. 27).

“The new products save 30% to 50% more mainframe cycles than the older products, and because of improved code, they operate faster,'' Hare said.

The base EView product, EView Entry, provides all of the necessary services, interfaces and automation features for the other EView tools.

> “The new products save 30% to 50% more mainframe cycles than the older products.”
>
> ▲▲▲

For example, EView Entry contains the interfaces to Information/Manager (Info/Man), NetView's database for network problem, change and configuration management data. It also provides interfaces to NetCenter and Graphics Monitor Facility, IBM's two NetView graphical user interface packages.

EView Entry lets users write commands that NetView can run automatically in case a predefined problem occurs. It contains a NetTech database for storing these commands.

On top of EView Entry runs the new Network Resource Manager, a tool that lets users define critical net resources for the NetView platform.

NetView monitors an entire enterprise equally, but the Network Resource Manager tool allows users to focus their net management coverage on a particular area or individual communications box deemed critical for net operations, Hare explained.

In conjunction with the user-defined EView automation commands, when a critical net resource fails, NetView can kick off an automated response.

The new Problem Manager Interface tool monitors NetView for duplicate net alarms or frequently occurring net problems. Instead of reporting each problem to the Info/Man database or NetView operator, it filters out duplicates and reports only one alert.

The first version of EView had a similar interface to Info/Man, but it did not eliminate as many duplicate alarms as the new version, Hare said. However, the number will depend on the user's net and EView configurations.

This feature is useful for Systems Network Architecture users with local-area networks linked to their SNA backbone because it is not uncommon for a LAN to restart many times a day, sending an alert to NetView each time.

“By reducing the amount of alerts NetView has to process, users save mainframe CPU cycles,'' he said. “Our users say they spend about $5,000 to $10,000 a day on processing NetView alerts. EView can cut that in half.''

The firm also introduced the NetTech Focal Point Manager, a tool that lets users monitor and manage multiple NetView managers from one location. “This feature helps users move to lights-out remote operations,'' he said.

The last new tool is Job/Task Monitor, which reports the status of all EView tool activity to the NetView operator.

All of the new products are available now. The onetime costs of the products are $3,000 for EView Entry; $6,000 for the Problem Manager Interface, Network Resource Manager and Job/Task Monitor; and $12,000 for the NetTech Focal Point Manager. ◻

Wall Data jumps into DEC mart

continued from page 9

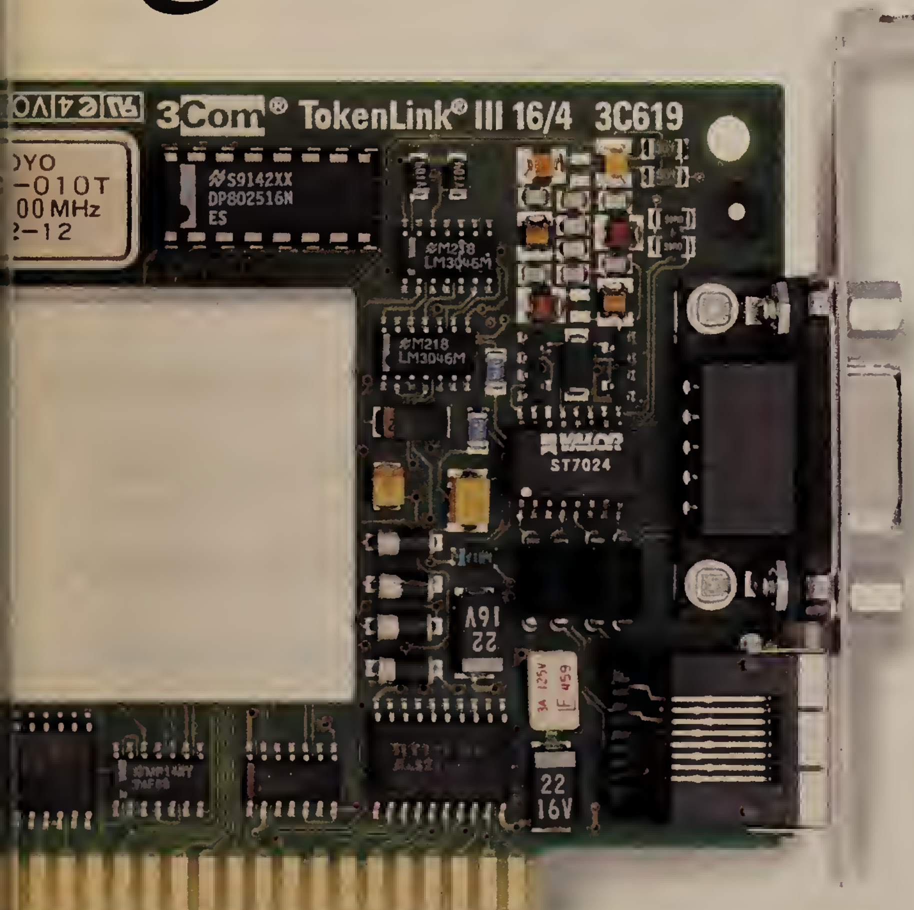
500,000 VAXes, PC-to-VAX connectivity represents a sizable opportunity for Wall Data, Callahan said. That opportunity is enhanced by the close working relationship between DEC and Microsoft to integrate Windows desktops into that installed base.

Besides IBM hardware, DEC VAXes represent “the next most popular environment in the corporate world,'' Callahan said. “Although [VAXes] are a terminal-centric world, PCs are becoming the dominant desktop machines. This makes client/server a big trend, but people aren't dumping their legacy applications overnight.''

Wall Data plans to support DEC's next-generation Alpha hardware architecture and Microsoft's Windows NT operating systems in a future version of Rumba, Callahan said.

Users can install Rumba for the VAX using menus, dialogue boxes and an on-line reference system. No text manuals are needed, according to Wall Data.

Rumba for the VAX, which costs $295 for a single-user license, will be available Feb. 1. ◻



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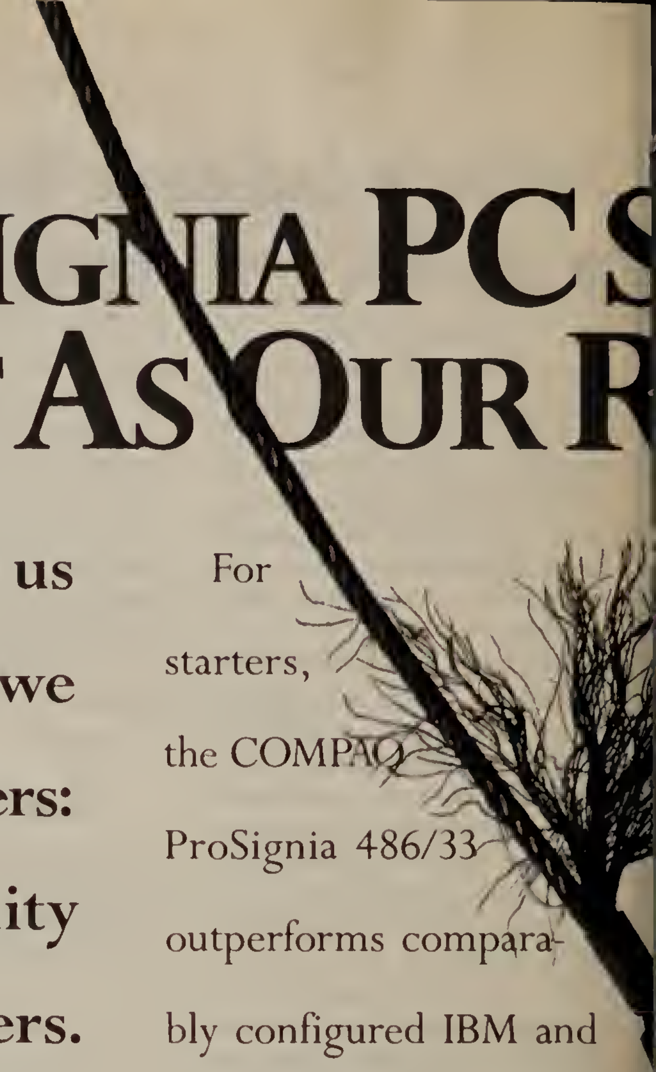

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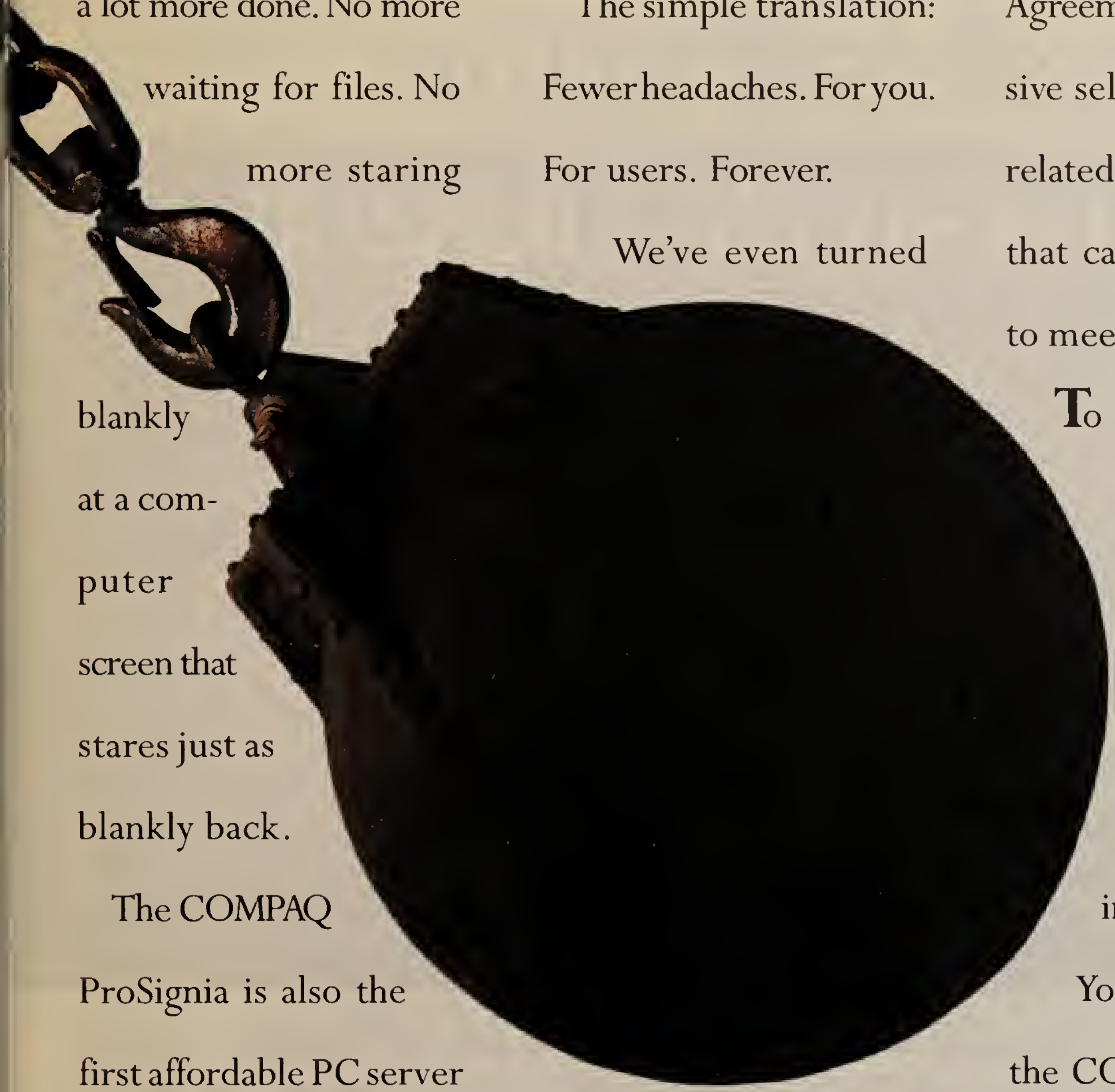

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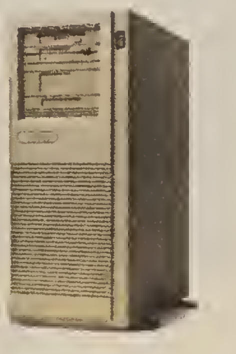

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intel inside

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Worth Noting

> "3Com users have steadfastly refused to migrate to LAN Manager; some even blame Microsoft for 3Com's decision to bow out of the NOS marketplace."
>
> **Stan Schatt**
> Analyst
> Computer Intelligence, Inc.
> La Jolla, Calif.

Netnotes

Novell, Inc. last week introduced NetWare In-Place Upgrade Utility Version 1.0, a product designed to make it easier for customers to upgrade from NetWare 2.X to NetWare 3.11.

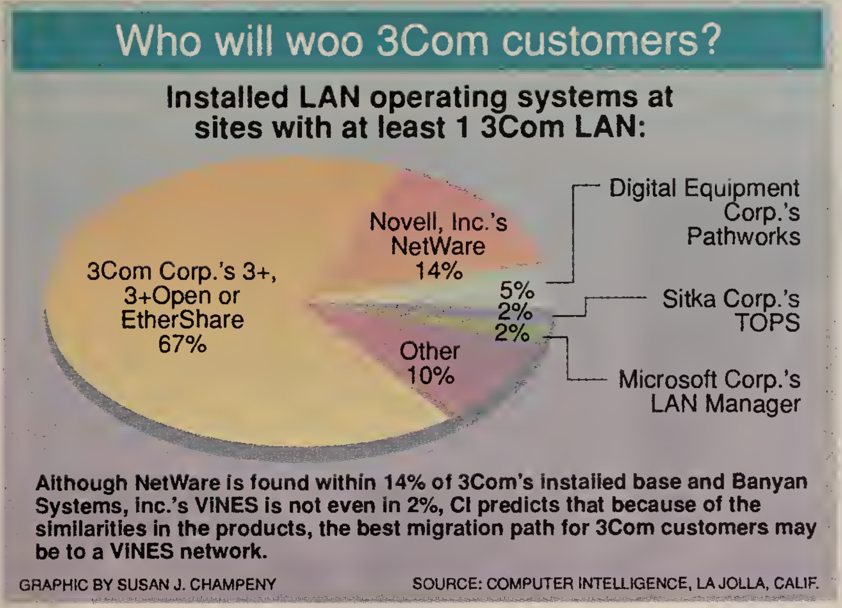
Server upgrades today require users to move all server data across the network to an alternate server or backup device, and then move it back once the upgrade is complete.

With the NetWare In-Place Upgrade Utility, administrators can perform upgrades with data resident on the server. The utility also automatically converts NetWare 2.X information into the NetWare 3.X bindery format.

The new utility is available now on NetWire and NetWare Express at no charge. The utility file name is 2XTO3X.ZIP.

Network Peripherals, Inc. last week cut prices on its Fiber Distributed Data Interface adapter cards by as much as 50%, bringing all card prices below $2,000. The company also released an entry-level FDDI concentrator at less than $1,000 per port.

The new modular FDDI Departmental Concentrator provides up to 16 FDDI connections and costs $3,995. According to the company, users also have the option of adding a Simple Network Management Protocol card for centralized management.



Who will woo 3Com customers?

Installed LAN operating systems at sites with at least 1 3Com LAN:

Although NetWare is found within 14% of 3Com's installed base and Banyan Systems, Inc.'s VINES is not even in 2%, CI predicts that because of the similarities in the products, the best migration path for 3Com customers may be to a VINES network.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: COMPUTER INTELLIGENCE, LA JOLLA, CALIF.

SCO unveils LAN Mgr. for Windows for Workgroups

New version provides better remote connectivity.

By Caryn Gillooly
Senior Editor

SANTA CRUZ, Calif. — The Santa Cruz Operation, Inc. (SCO) last week released a new version of its Microsoft Corp. LAN Manager for SCO Systems software that adds support for Microsoft's Windows for Workgroups clients and enhanced remote management capabilities.

The new release, Version 2.2, is based on Microsoft's recently announced LAN Manager for Unix Version 2.1A. Unlike the previous version, Version 2.2 will be available in two configurations — the Workgroups Edition for Windows for Workgroups users and the Enterprise Edition for customers with more of a mixed environment.

The product is basically a version of Microsoft's LAN Manager for Unix that is specially designed to give DOS-, Windows- and OS/2-based systems access to applications, information and resources on SCO Unix-based servers.

Targeting two markets

The new Workgroups Edition will contain server software and documentation and will interoperate with machines running Microsoft's Windows for Workgroups Version 3.1, giving users access to a server-based environment. The Enterprise Edition will contain server software, MS-DOS and OS/2 client software and documentation.

"By offering the base package in two separate editions, SCO is positioning the product for two distinct markets with their unique requirements," said Dipak Basu, product-line manager for enabling systems at SCO. "This [lets SCO] provide an entry-level server platform for peer-to-peer work groups on one hand and a connectivity tool for DOS/Unix integration in advanced client/server environments on the other."

Other new features of Release 2.2 include remote booting and remote administration capabilities, in addition to easier installation and setup.

According to SCO, special features for Windows for Workgroups users include central management and security, as well as easy upgrades to a higher end computing platform if the need arises.

Microsoft LAN Manager for SCO Systems supports a variety of protocols, including the Transmission Control Protocol/Internet Protocol, Open Systems Interconnection, Novell, Inc.'s Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX) and X.25, in addition to Banyan Systems, Inc.'s VINES and Digital Equipment Corp.'s DECnet protocols.

The product is expected to ship by the end of the month. The Workgroups Edition is licensed for five users and will cost $1,295, while the Enterprise Edition is licensed for 15 users and will cost $2,995. SCO will also offer a 10-user and unlimited-user upgrade for both editions for $1,295 and $2,995, respectively.

Apple readies attack on enterprise front

Vendor expected to make push into market with high-end servers, followed by first OCE products.

By Caryn Gillooly
Senior Editor

It's no secret that Apple Computer, Inc. has had problems of late passing itself off as an enterprise vendor.

Critics say the company does not offer the same level of interconnectivity with other vendors' products as its closest competitors. Even if such capabilities were in place, they add, Apple would still lack an enterprisewide strategy for bringing all the heterogeneous pieces together.

Starting next year, however, Apple is expected to make a concerted effort to fight that nonenterprise perception with a number of new offerings that are expected to include both hardware and software.

The first product release will likely be Apple's new, long-rumored high-end server. That machine, code-named Menagerie, has already hit the beta streets, sources said.

Like the existing Quadra, Menagerie is a tower server, "but bigger," according to one source who requested anonymity. It has a faster processor than the Quadra — a 40-MHz Motorola, Inc. 68040 — and comes preloaded with the company's A/UX Unix operating system.

Menagerie also reportedly comes with Oracle Corp.'s Oracle 7 database, support for the Transmission Control Protocol/Internet Protocol and Open Systems Interconnection procotols as well as a price tag of less than $10,000, although this could not be confirmed.

These new systems alone, however, will not give Apple the enterprise networking capabilities it so sorely needs.

"Apple has never produced an enterprise server — the best they have is a high-end Mac running

(continued on page 21)

Firm releases Mac version of SNMP net mgmt. system

By Skip MacAskill
Staff Writer

MILPITAS, Calif. — Network Resources Corp. (NRC) last week rolled out a Macintosh version of its Simple Network Management Protocol-based net management system.

MultiGate Manager SNMP for Macintosh, which debuts in Version 4.0, is based on NRC's proprietary AppleTalk-based net management system for its MultiGate stackable hub line. The product provides easy access to net information via a new customizable graphical user interface (GUI).

The new software will run on any 68020- or 68030-based Macintosh, including all Macintosh II's, Quadras and PowerBooks. Version 4.0 does not require a specific Apple operating system, but the next release will need System 7 in order to take advantage of certain applications.

"The net manager can tailor the system to meet his particular needs through the customization feature," said Bradley Brown, product marketing manager for NRC. "It's easy to load and get running, and you don't have to be an SNMP guru to use it."

Through the GUI, net managers can create multiple network views that contain logical groupings of SNMP devices on the net and garner a wide range of information, including device name, Internet Protocol address, port status, alarms and SNMP traps.

"Unlike most graphical management systems that require the user to navigate through several windows to get detailed information, MultiGate Manager provides specific device information with a single mouse click or menu selection," Bradley said.

Version 4.0 supports SNMP Management Information Base II and offers full window resizing and management, including the

(continued on page 21)

En

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Apple readies attack on enterprise front

continued from page 17

A/UX and AppleShare, and that's just not sufficient," said Pieter Hartsook, editor of the Hartsook Letter, a Macintosh market research service based in Alameda, Calif. "It's OK for small businesses with 15 to 20 machines, but it's inadequate for larger sites."

Other analysts, and users, agreed.

"We're now living under System 7, but we'll be putting in Novell [NetWare] in about a month," said Dan Siegel, an attorney at the law offices of Weil, Gotshal and Manges in Menlo Park, Calif. "I would prefer to be an all-Mac shop, but I don't know that Apple has a good enough solution to support Macs and PCs as well as NetWare."

Charles Casale, chairman of Aberdeen Group, Inc., a Boston consulting firm, said, "Corporate users want Apple to start acting more like a computer company rather than a consumer products company.

"Apple's competition is IBM, DEC and HP. All three offer an impressive range of hardware, software and internetworking products," Casale continued. "But relative to these three, Apple comes up short."

Two-thirds of the Apple users Aberdeen surveyed said Apple's services meet their current needs, he said, but 75% said the services won't meet their future needs.

To combat the problem, Hartsook predicted that early next year, Apple will begin rolling out the first parts of its Open Collaboration Environment (OCE) announced more than a year ago.

OCE, ultimately, will be a set of both front-end and back-end application program interfaces (API) included in its System 7 operating system. Vendors will be able to employ these APIs to write applications that use a common set of network services.

Front-end APIs will let developers build applications that interact with the end user, generating requests to servers or databases, and displaying and manipulating information. Back-end APIs will be used by vendors of products that process those requests, such as companies offering database management systems.

According to Apple, both sets of APIs will provide access to existing network services, such as directory services, that will either be provided by Apple or are industry-standard, such as the X.400 electronic mail transport standards. With OCE, therefore, programs will be able to use the same set of network services and work with other applications developed for OCE.

"Adding OCE to the operating system will provide the communications, security and directory services" Apple needs to compete on an enterprise level, Hartsook said. "Apple would be remiss if they didn't deliver OCE in the first half of the year. And since it will likely be a several-part rollout, I expect the first parts will be delivered in the first quarter."

Apple would not comment on the release of either Menagerie or OCE but stressed it is more of an enterprise vendor than the industry perceives.

"We're a multifaceted computing company," said an Apple spokesman. "We're working in enterprise systems, we're working in open systems, we're working with partners, and we're putting the technology in place to solve broader IS issues."

Even with the release of both Menagerie and the first phases of OCE, Hartsook predicted it will not be until 1995 that the effects of Apple's enterprise-push efforts will kick in.

"This year's announcements will pave the way," he said, but the company "will have a hard time capturing the large enterprise market and taking business away from DOS, [Microsoft Corp.] Windows and Unix." ☒

Firm releases Mac SNMP mgmt. system

continued from page 17

ability to hide windows, which is helpful in organizing the screen when the net manager is working on several windows at once.

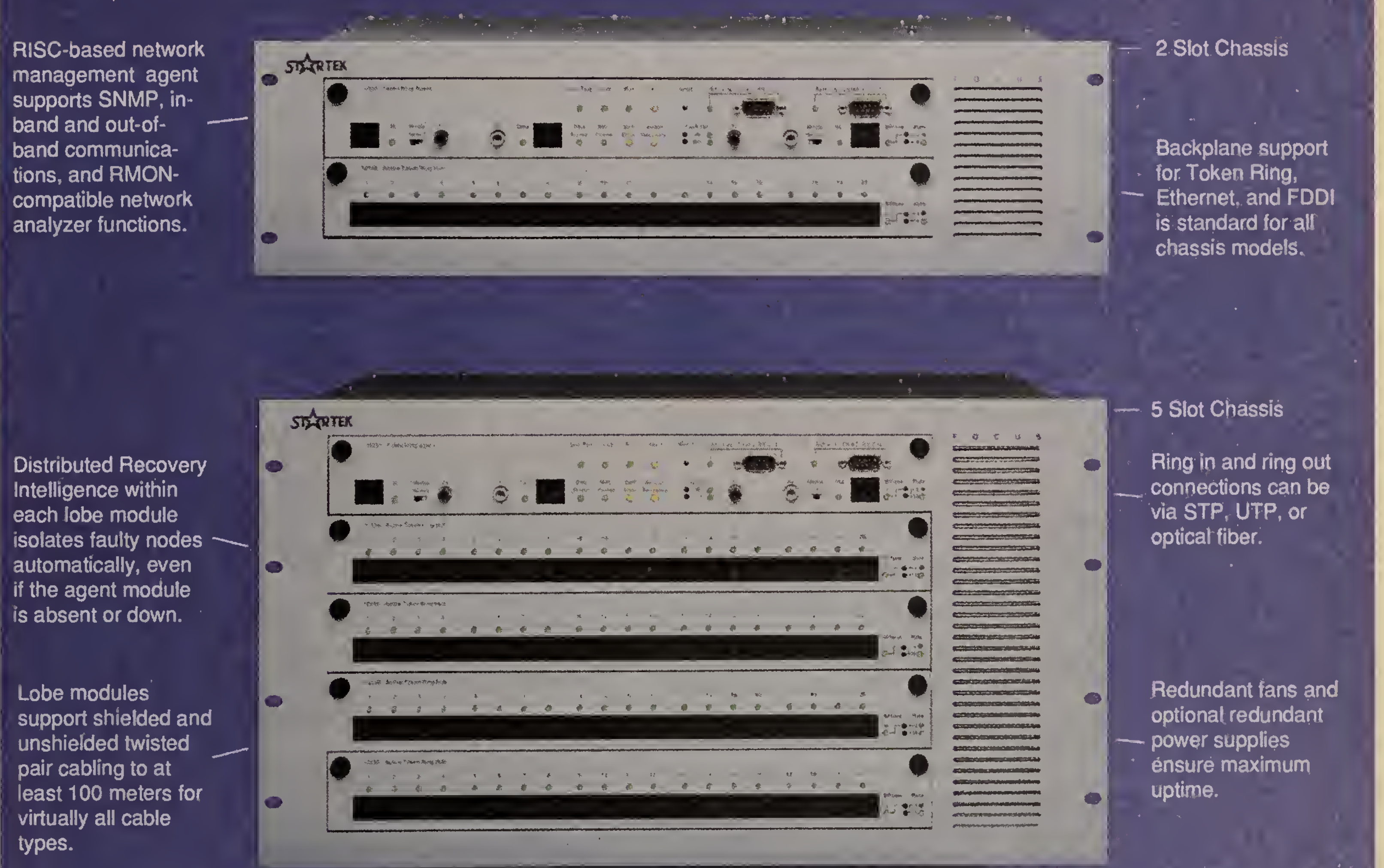
The software also allows one Macintosh to support five monitors, enabling the net manager to increase screen capacity while monitoring multiple devices across the net.

Other features supported by MultiGate Manager include the ability to ping any Transmission Control Protocol/IP address, logging of statistics, variable polling rates for each window and a log of all SNMP traps.

MultiGate Manager SNMP for Macintosh Version 4.0 is available now and costs $995, which includes Apple Computer, Inc.'s MacTCP software, the Macintosh-specific version of TCP/IP.

For a limited time, NRC is offering MultiGate Manager bundled free when purchased with a MultiGate hub. Existing users of the AppleTalk version of MultiGate Manager can get a free upgrade. ☒

Focus On Token Ring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(Network World, Dec. 92)

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Worth Noting

> "If ATM is successful, which seems likely now, I suspect there won't be a lot of growth for routers and their use will eventually decline. But I hate to say that because old technologies never die; they get transformed and never really go away."
>
> **Jonathan Turner**
> Chairman of the computer science department
> Washington University
> St. Louis

Link Notes

Cisco Systems, Inc. last week announced a new connector that makes it easier to attach its routers to legacy IBM Synchronous Data Link Control devices.

SDLC Applique obviates the need for SDLC cluster controllers to be connected through stand-alone converters or reconfigured for attachment to Cisco routers.

It supports both data encoding schemes used by cluster controllers to derive clocking information — Non-Return to Zero and Non-Return to Zero, Inverted — and supports half-duplex operation when configured as a data communications equipment device.

Previously, Cisco routers did not support Non-Return to Zero, Inverted and could only accommodate full-duplex devices ("Bank buys into Cisco plan for handling SNA traffic," *NW,* Nov. 9).

SDLC Applique is available now and ranges in price from $150 for one RS-232 serial connection to $1,200 for eight such connections. ◘

Hadax adds built-in mgmt. station to its MAU series

Offers range of net information on 3 token rings.

By Skip MacAskill
Staff Writer

RIDGEFIELD PARK, N.J. — At the ComNet conference in February, Hadax Electronics, Inc. will roll out an advanced version of its token-ring multistation access unit (MAU) that can provide a wide range of net information via a built-in management agent.

The Ringtamer Series 111 Triple Ring Advanced MAU provides a serial port for out-of-band management.

Through a personal computer linked to the serial port, users can access management information, such as ring configuration, usage, beaconing errors, cable failures, alarms and system events, compiled by a dedicated microprocessor.

One Series 111 MAU can manage as many as three token-ring local-area networks. Users can switch between the rings without physically reconfiguring the MAU, thus eliminating the need for an external bridge or router.

The new MAU, which operates at 4M or 16M bit/sec and comes in eight- or 16-port versions, can be managed by Hewlett-Packard Co.'s OpenView network management system, but that system is not required for operating the built-in monitoring system.

The 111 also offers beacon detection and automatic ring recovery within one second via Hadax's hardware design and Traffic In/Out (TIO) software, which monitors traffic I/O on each port. Cabletron Systems, Inc. and Optical Data Systems, Inc., in comparison, provide automatic recovery in eight seconds.

Because of the TIO software, Hadax can also prevent beaconing nodes from gaining entrance to the ring. Beaconing is a token-ring error condition caused by a faulty cable connection or situations where users try to plug in devices that are either not token ring-compatible or set at the wrong speed.

Bytex Corp.'s Beacon Guard and Star-Tek, Inc.'s Zero Delay Lockout also offer this type of isolation feature for token-ring networks.

The 111, which supports shielded and unshielded twisted-pair connections as well as fiber-

(continued on page 26)

3Com unveils new routing pack for remote devices

By Skip MacAskill
Staff Writer

SANTA CLARA, Calif. — 3Com Corp. last week announced its Boundary Node System Architecture, specially configured routing software designed to help users connect remote local-area networks to corporate LANs more quickly, easily and inexpensively.

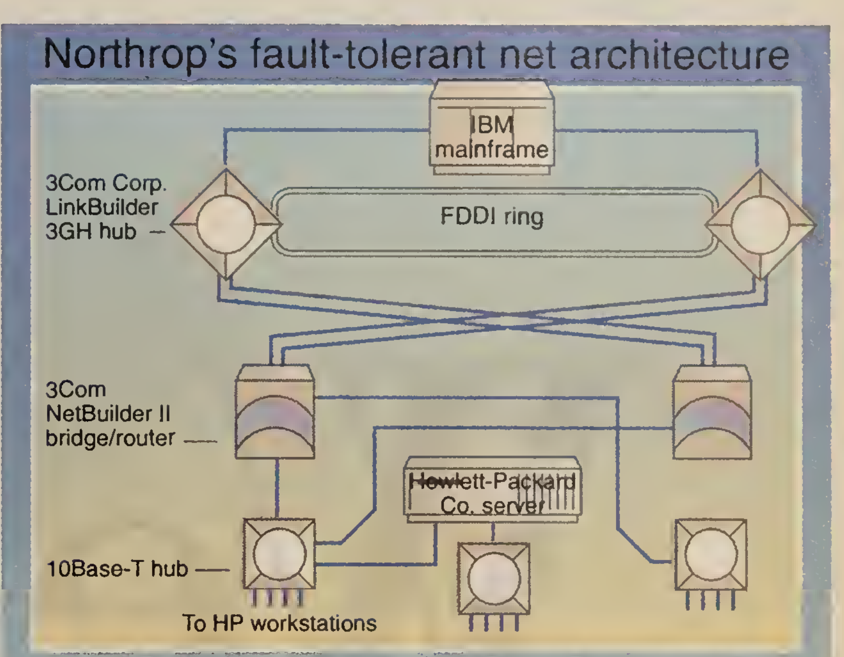
The company hopes to present the technology to the Internet Engineering Task Force (IETF) in November 1993 to be considered for adoption as an open standard. Prior to that time, 3Com will offer Technical Service Agreements to other vendors that want to implement it.

The Boundary Routing architecture was designed to simplify the role of a remote router with a single wide-area link into a corporate network and, thus, ease remote site net management and maintenance.

In effect, the remote router will only need to decide whether to forward a packet to the corporate network. It will not have to maintain complete routing tables, perform packet identification or do routing and network management. Those functions will be off-loaded to a router on the corporate network, allowing traffic from the remote site to flow more quickly and efficiently to the corporate LAN.

Since the remote router must forward all wide-area network packets across the same link, there is no need for it to maintain routing tables on a variety of specific protocols. A router based on Boundary Routing does retain a Class of Service function in order to prioritize protocols, however.

(continued on page 26)


Northrop's fault-tolerant net architecture
IBM mainframe
3Com Corp. LinkBuilder 3GH hub
FDDI ring
3Com NetBuilder II bridge/router
Hewlett-Packard Co. server
10Base-T hub
To HP workstations

Northrop's dual-homed network architecture provides multiple levels of redundancy by giving each work group LAN hub a link to 2 routers and each router dual links to an FDDI backbone.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: NORTHROP CORP., HAWTHORNE, CALIF.

Northrop deploys dual-homed FDDI net

Fault-tolerant net will have almost 100% uptime, will support design and development of F/A-18 jets.

By Maureen Molloy
Senior Writer

HAWTHORNE, Calif. — Northrop Corp. will finish constructing by the end of this year a customized FDDI network that will provide five times more fault tolerance and reliability than a standard FDDI backbone.

The aerospace giant is implementing the net topology, dubbed dual homing, in an effort to guarantee nearly 100% uptime for the mission-critical applications that run across its internet. When completed, it will protect end users from service disruptions, even if half the equipment on the Fiber Distributed Data Interface backbone malfunctions.

"We originally didn't consider FDDI robust enough to meet our requirements," said Rob Goldberg, Northrop's principal network technologist. "But the concept of a dual-homing architecture and implementing a hierarchical approach to FDDI changed all of that."

Northrop's corporate internet spans the nation and links more than 30,000 end users at 40 sites. The new high-speed fault-tolerant net design was implemented at two sites here in order to support the engineering, manufacturing and development phase of the U.S. Navy's Fighter/Attack-18 Plane Support Network program, of which Northrop is a prime subcontractor.

The dual-homed FDDI net connects Ethernet and token-ring local-area networks to mainframes via a 5-km FDDI link and will initially support about 300 Hewlett-Packard Co. workstations that are tied to IBM hosts acting as file servers.

> The aerospace giant is implementing the net topology in an effort to guarantee nearly 100% uptime for its mission-critical applications.

▲▲▲

The meshed network includes 3Com Corp. LinkBuilder 3GH intelligent hubs and 3Com NetBuilder II routers. Two hubs are linked via an FDDI ring, and each router has a connection to both hubs, although only one link is active at a given time (see graphic, this page). That gives each router a backup data path and enables the network to sustain a failure on either hub.

(continued on page 27)

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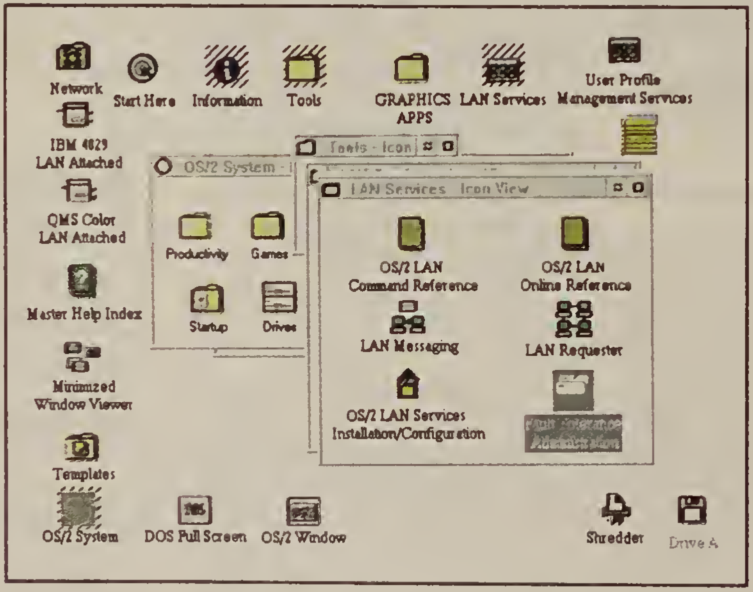

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Bytex teams with Crescendo to begin supporting FDDI

By Maureen Molloy
Senior Writer

WESTBOROUGH, Mass. — Hub vendor Bytex Corp. last week said it has entered into an agreement with Crescendo Communications, Inc. to resell that company's line of products for FDDI over fiber and copper wiring.

The two companies have also agreed to jointly develop Fiber Distributed Data Interface modules for Bytex's Series 7700 Intelligent Switching Hub, rounding out Bytex's offerings by enabling users to link Ethernet, token-ring and FDDI local-area networks through a single device.

Bytex will immediately begin reselling Crescendo's 1000 Workgroup Concentrator series and adapters. The Crescendo 1000 series includes an eight-port FDDI hub for 100M bit/sec connections over fiber at distances up to 2 km. It also includes a Copper Distributed Data Interface (CDDI) version that supports FDDI up to 100 meters over shielded or unshielded twisted-pair wiring.

Both hubs include a Simple Network Management Protocol agent that will enable users to control the hubs from Bytex's Series 7700 Network Management System, the SNMP-based platform from which the Bytex Series 7700 intelligent hub is managed.

Both Crescendo concentrators provide eight master ports that link any workstation or server. Two additional FDDI or CDDI ports can be added to the hubs via an optional interface module. The optional A/B Port Interface Card can be used in any FDDI configuration.

According to Bytex, by the middle of next year, it will release integrated FDDI and CDDI modules for Bytex's Series 7700 hub that it will jointly develop with Crescendo. By early 1994, Bytex said it will also deliver an integrated Ethernet and token ring to FDDI bridge/router modules for the Series 7700.

The Crescendo FDDI Workgroup Concentrator is priced at $7,995, and the CDDI Workgroup Concentrator costs $12,995. The FDDI and CDDI adapter cards cost $2,395 and $1,495, respectively. The FDDI A/B Port Card is priced at $2,995, while the CDDI A/B Port Card is tagged at $995.

3Com unveils routing pack

continued from page 23

"Boundary Routing will let users add five to 10 times more remote locations without increasing resources or costs," said Jeff Krause, 3Com's director of internetworking technology. "That is because less management will be needed for the remote devices, which means less people will be needed at remote sites for maintainence and installation."

Installing remote routers will be simplified because users only have to insert the Boundary Routing diskette into the hard drive and power up the device. Additionally, any new routing functions added to a network would only require upgrades to the central routers.

Since most remote sites are Systems Network Architecture environments, 3Com said it plans to integrate SNA and LAN internetworking capabilities into the new architecture but declined to provide further details.

In the first half of next year, 3Com will offer unspecified hardware platforms that support either Ethernet or token ring and the Boundary Routing architecture. Connection to a 3Com NetBuilder II bridge/router at the central LAN would then be made through a leased-line or dial-up connection. Software to upgrade the NetBuilder II will also be available at that time.

In the second half of 1993, more WAN interface options, including frame relay and X.25, will be added to the hardware platforms, along with improved traffic management and configuration tools.

Software upgrades will also be available to boost a Boundary Routing-based device to a standard router in the event that a remote site grows larger or needs more than one WAN link to a corporate WAN.

Pricing and availability of the new products will be announced in first-quarter 1993.

Hadax MAUs get mgmt. station

continued from page 23

optic links, can operate in a managed or passive mode. In the event of a power failure, it will continue to operate as a dumb MAU while still conforming to the IEEE 802.5 standard. Memory backup is also provided to reconfigure the network when power is restored.

According to David Foni, executive vice-president at Hadax, the company will roll out more features for the 111 at INTEROP 92 Spring in Washington, D.C. this March, including Simple Network Management Protocol support and fiber-optic repeaters for ring-in/ring-out operation.

Software that will extend the distances between MAUs beyond the current 4,000-ft. limit is expected by the second quarter of 1993, he added.

The Ringtamer Series 111 Triple Ring Advanced MAU will be available in February for $2,950. The 111 can also be bundled with OpenView and Hadax's proprietary net management software, which allows one Advanced MAU to manage as many as 256 other MAUs, for an additional $2,800.

3Com's new hub is also a hub, a

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Firm boosts PowerHub's performance

By Maureen Molloy
Senior Writer

SAN JOSE, Calif. — Alantec last week announced new software for its internetworking hub that boosts the device's bridging and routing performance by as much as 30%.

The System Software Version 1.6 for the vendor's PowerHub will also enable users to filter network-layer protocols such as the Transmission Control Protocol/Internet Protocol.

The PowerHub is a local internetworking hub designed for work groups running bandwidth-intensive applications. It has a bus speed of 120M bit/sec and supports as many as 76 10Base-T connections over 12 internal Ethernet local-area networks.

Bridging rates

In router performance tests conducted recently by Scott Bradner at Harvard University's Network Test Device Lab, a PowerHub equipped with the new System Software bridged packets at 80,000 packet/sec, up from 62,000 packet/sec using an earlier software version. It was also able to route packets at up to 64,000 packet/sec — a 25% increase from its previous maximum speed of 51,000 packet/sec.

According to Yancy Lind, Alantec's director of marketing, the vendor's new software also provides TCP/IP protocol filtering, which improves security and net administration by limiting access between nets.

Filtering for upper layers

In addition to TCP/IP, the software also provides filtering for higher layer TCP/IP protocols such as the Simple Network Management Protocol and Telnet, as well as the Routing Information Protocol and the Open Shortest Path First interrouter protocols.

For instance, the software enables a network administrator to bar users from accessing specified hosts or subnets, as well as block SNMP queries from certain devices.

The software is available now at no additional cost to current PowerHub customers. ◻

Firm deploys dual-homed net

continued from page 23

In a standard FDDI network where all the devices are attached to the FDDI ring, the failure of any two nodes on the net effectively segregates users into two isolated rings that cannot communicate with each other.

Under the dual-homed architecture, each LAN is also linked to two routers, although only one link is active at any time. This provides load balancing so that if any one router fails, another router will handle its traffic load without any real performance degradation.

To ensure that performance is not degraded in the event of a router failure, each router is loaded to only half its full capacity.

"It's brought the net 50% capacity redundancy, so up to 50% of the FDDI equipment in the net can fail without disrupting operations," Goldberg said.

In addition to vastly improving reliability, the net will allow Northrop to reduce its time to market as well as boost its overall competitiveness, he added.

"Reliability and security are our biggest requirements," Goldberg said. "Not only can one small outage affect more than 300 engineering workstations, but, as a goverment subcontractor, we would incur stiff penalties by being late on any [product]."

Although some vendors promote behemoth fault-tolerant routers with multiple interfaces and high-speed backplanes to provide redundancy, Goldberg decided it was more prudent to deploy a multitude of smaller routers to achieve the same goal.

The drawbacks

The caveat of this architecture, however, is that it can be twice as expensive to install as a classic FDDI implementation. Northrop decided its applications warranted the investment since an hour-long network outage can translate into a $1 million loss to the company's bottom line, not including the additional fines that would be levied as the result of a missed deadline.

Another key point, Goldberg said, is that the successful implementation of this near-failproof net depends on intelligence in every device on the network. That is, each hub requires alternate Transmission Control Protocol/Internet Protocol addresses to alert it to the multiple routers — or default gateways — it can use. Furthermore, the IBM mainframes and HP workstations need to know that when their primary router goes down, they have an alternative path.

"These are the issues we're working with right now to reach 100% reliablity," he added. "To my knowledge, no vendor has yet pushed fault-tolerant networking to the degree where they consider every single one of the components in the network."

Goldberg said the dual-homing architecture has now been adopted as the standard for upgrading Northrop's extensive Ethernet and token-ring backbone nets to FDDI. ◻

Northrop's new net to aid employees in their development of F/A jets.

hub, a *hub*, and a **hub**.

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Worth Noting

> "While most Western European countries have the network infrastructure needed to make the most of frame relay, users should remember that most other countries — including Eastern Europe and what used to be the Soviet Union — are, at best, good candidates for X.25."

Alan Taffel
President
Frame Relay Forum
Vice-president of market development
Sprint International
Reston, Va.

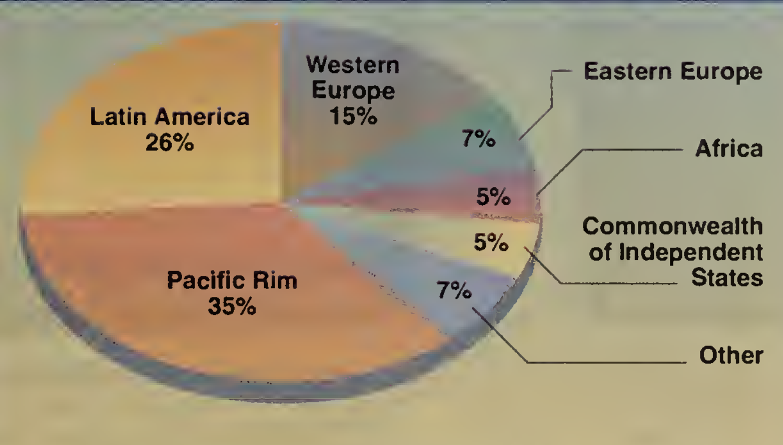
Carrier Watch

The **Federal Communications Commission** last week denied a petition for emergency relief from Business Watts, Inc., a reseller of AT&T network services that sought FCC intervention in a business dispute with the carrier.

Business Watts wanted the FCC to issue an order preventing AT&T from disconnecting its access to the carrier's network services due to a disagreement over charges. Business Watts also wanted the FCC to prevent AT&T from provisioning network services to the reseller's customers.

The commission rejected the petition after determining that the company would not be irreparably harmed by paying the disputed amounts or by meeting AT&T's demands for advance payments. The FCC added that it is "disinclined to intervene in matters involving a carrier's decision to terminate services." ◼

Users' plans for global network expansion over the next 2 years



Figures are based on a survey of 68 U.S.-based multinational companies with public, private or hybrid international networks.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: THE YANKEE GROUP, BOSTON

Users push FCC to cross another portability hurdle

Group asks for more time to make 800 switch.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Now that the Federal Communications Commission has pushed back the deadline for 800 portability from March to May 1993, users are saying the agency needs to take one more step to assure that users get the full benefit of portability.

According to FCC rules issued last year, Tariff 12 customers that have deals in place before April 16 will be able to drop their deals with AT&T and move to another carrier without penalty.

> The risk of disruption may be enough to keep some users from taking advantage of portability.
>
> ▲▲▲

The FCC devised this rule to ensure that AT&T could not unfairly lock its customers into long-term contracts that would prevent them from taking advantage of 800 portability by moving to a new carrier. The FCC is allowing customers 90 days after portability becomes available to make the switch.

However, the Ad Hoc Telecommunications Users Committee has asked the FCC to give users more time. The committee asked the FCC to extend the period to 90 days after the availability of a software feature known as notice and acceptance.

This feature will eventually reside in the new database system being implemented to support 800 portability and will notify a long-distance carrier automatically that a customer intends to begin routing 800 traffic to its network. The notice-and-acceptance feature is not expected to be available until October 1993.

Without the software capability, notice that new traffic is being routed to a carrier must be done manually. James Blaszak, counsel for the Ad Hoc Committee, said large users are unwilling to risk their vital 800 traffic to the fallible manual system.

The risk of service disruption due to incorrect routing of 800 traffic may be enough to keep some users from attempting to take advantage of 800 portability, Blaszak said.

The FCC agreed to accept comments from the industry on whether the period during which Tariff 12 users can switch should be extended.

In a related development, Sprint Corp. filed an emergency petition asking the FCC to extend the period for users to switch from 90 to 180 days.

The carrier also asked the FCC to allow customers of all AT&T's long-term 800-service plans, not just Tariff 12 users, to have the option of moving to a new carrier after 800 portability. ◼

Sprint freezes plans for Multirate ISDN

Carrier not giving up on service, but emergence of inverse multiplexing forces delay up to one year.

By Bob Wallace
Senior Editor

WASHINGTON, D.C. — Sprint Corp. last week said it has temporarily frozen plans to roll out a service that would enable users to establish switched service links at speeds up to T-1.

The service, Multirate Integrated Services Digital Network, was intended to enable ISDN Primary Rate Interface (PRI) users to establish — on demand — switched digital links at speeds ranging from 64K to 1.544M bit/sec.

Although Sprint has not given up on Multirate, the carrier admits that the rapid emergence of inverse multiplexers has forced it to delay by roughly one year the testing and deployment of the service.

Invested effort

Sprint said it worked with Northern Telecom, Inc. for close to two years to provide the software upgrade and hardware needed in order for its DMS-SuperNodes switches to support Multirate ISDN.

"We decided in 1990 that we'd need a high-speed switched service and thought Multirate would fit the bill," said Bernie Schneider, director of product management for Sprint Data Group. "But we had no idea how quickly inverse multiplexing would come along."

Having spent years of effort and what Schneider terms "a very substantial number of dollars" to develop Multirate, Sprint plans to plod ahead with the network service, albeit on a revised schedule.

The carrier had planned to conduct Multirate field trials with users by now and make the service generally available in late 1993. Sprint is now planning to conduct field trials in the second half of 1993, with general availability in early 1994 if there is adequate user demand.

"We haven't yet seen much user demand for Multirate," Schneider said. "And obviously,

(continued on page 32)

MFJ issues top Congress' communications agenda

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Prominent leaders from industry, Capitol Hill and the Federal Communications Commission predicted that the top network topics occupying Congress next year will be changes to the Modified Final Judgment, building a new telecommunications infrastructure for the country and fostering competition and network quality.

Appearing at a conference sponsored by the Practicing Law Institute and the Federal Communications Bar Association, Rep. Billy Tauzin (D-La.), a returning member of the U.S. House Subcommittee on Telecommunications and Finance, said Congress has to handle some housekeeping matters when it returns in January, but it won't take long to get going on communications issues.

He predicted quick action on questions surrounding business areas that the regional Bell holding companies will be allowed to enter.

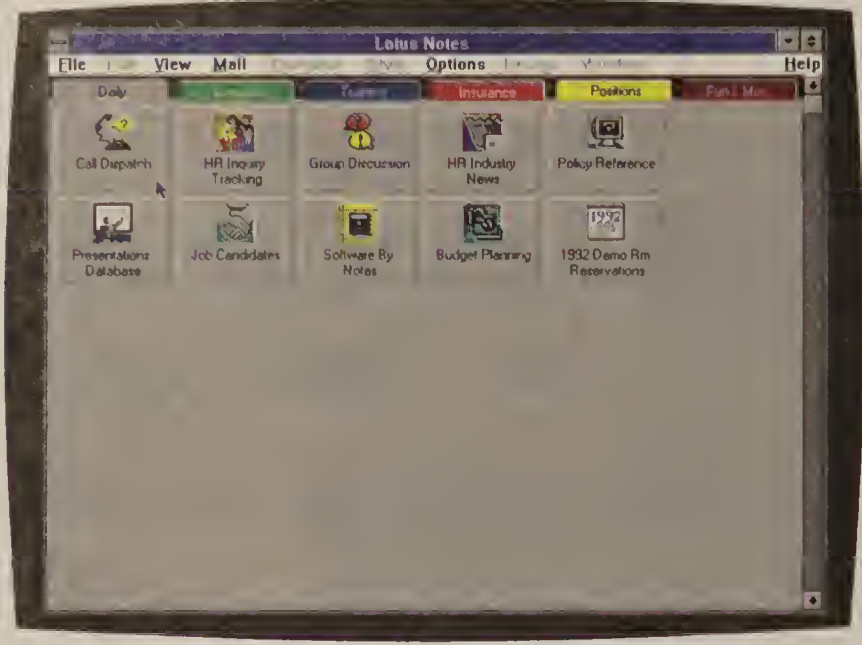
A federal appeals court has allowed the RBHCs to offer information services, but the carriers are pressing to be allowed to manufacture customer premises equipment and compete for long-distance service, two areas currently off-limits due to MFJ restrictions.

Gerry Waldron, senior counsel for the subcommittee, agreed that the MFJ will top Congress' slate next year.

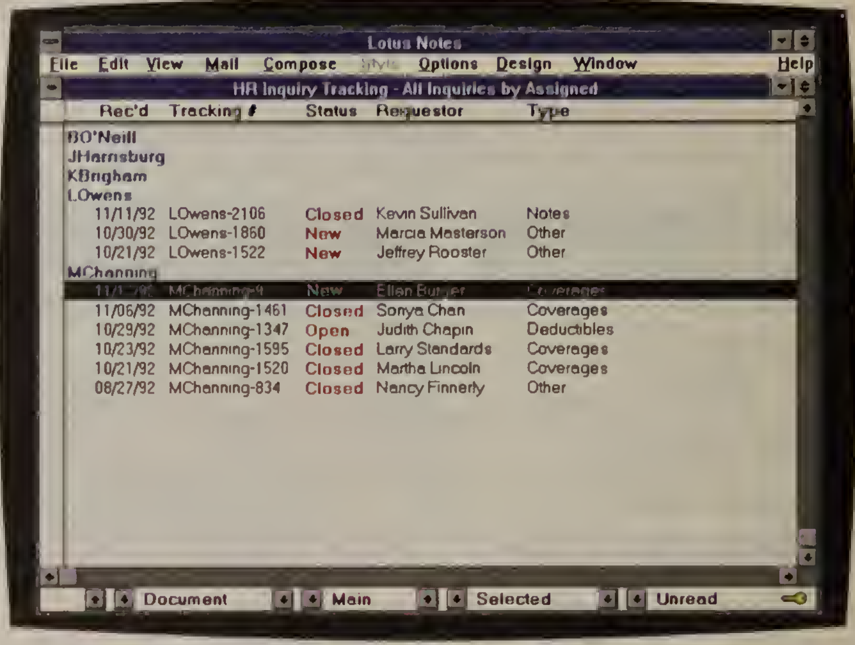
"The MFJ bill is the No. 1 telecommunications issue before [the subcommittee's parent] the Energy and Commerce Committee," he said.

Congress will also try to deal

(continued on page 32)

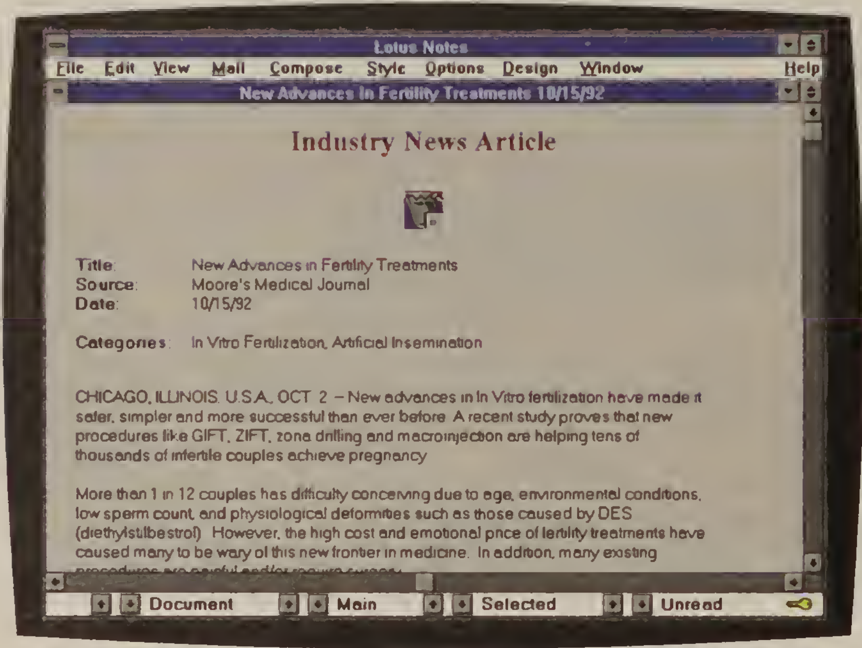


1. This is Mike's Notes desktop. Each icon represents a different database. In the course of the day, he generally uses them all. To start the day, Mike decides to check if any new benefits questions have been forwarded his way. He double-clicks on the CALL DISPATCH database icon.



Rec'd	Tracking #	Status	Requestor	Type
BO'Neill				
JHarrisburg				
KBrigham				
LOwens				
11/11/92	LOwens-2106	Closed	Kevin Sullivan	Notes
10/30/92	LOwens-1860	New	Marcia Masterson	Other
10/21/92	LOwens-1522	New	Jeffrey Rooster	Other
MChanning				
[illegible]	MChanning-9	New	Ellen Burger	Coverages
11/06/92	MChanning-1461	Closed	Sonya Chan	Coverages
10/29/92	MChanning-1347	Open	Judith Chapin	Deductibles
10/23/92	MChanning-1595	Closed	Larry Standards	Coverages
10/21/92	MChanning-1520	Closed	Martha Lincoln	Coverages
08/27/92	MChanning-834	Closed	Nancy Finnerly	Other

2. Well, there's one that hasn't been read. Ellen Burger has a question about her coverage. Ellen called the company's BENEFITS HOTLINE. The operator entered her query into Notes and it was automatically routed to Mike. Mike double-clicks to find out what the problem is.



Industry News Article

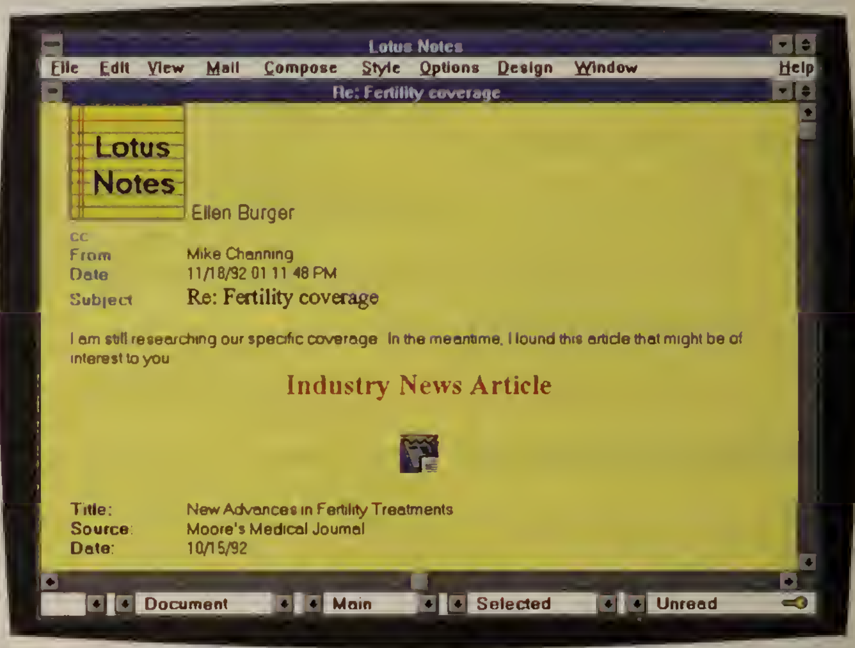
Title: New Advances in Fertility Treatments
Source: Moore's Medical Journal
Date: 10/15/92

Categories: In Vitro Fertilization, Artificial Insemination

CHICAGO, ILLINOIS U.S.A. OCT 2 – New advances in In Vitro fertilization have made it safer, simpler and more successful than ever before A recent study proves that new procedures like GIFT, ZIFT, zona drilling and macroinjection are helping tens of thousands of infertile couples achieve pregnancy

More than 1 in 12 couples has difficulty conceiving due to age, environmental conditions, low sperm count, and physiological deformities such as those caused by DES (diethylstilbestrol) However, the high cost and emotional price of fertility treatments have caused many to be wary of this new frontier in medicine. In addition, many existing

5. He simply double-clicks INDUSTRY NEWS, and searches two categories: In vitro fertilization and artificial insemination. First up is a recent story from Moore's Medical Journal. Since the article includes authoritative information, he decides to forward it to Ellen.



Ellen Burger
cc
From: Mike Channing
Date: 11/18/92 01 11 48 PM
Subject: Re: Fertility coverage

I am still researching our specific coverage In the meantime, I found this article that might be of interest to you

Industry News Article

Title: New Advances in Fertility Treatments
Source: Moore's Medical Journal
Date: 10/15/92

6. Mike quickly composes a note, attaches the article and sends it directly to Ellen. That done, he gets himself a cup of coffee.

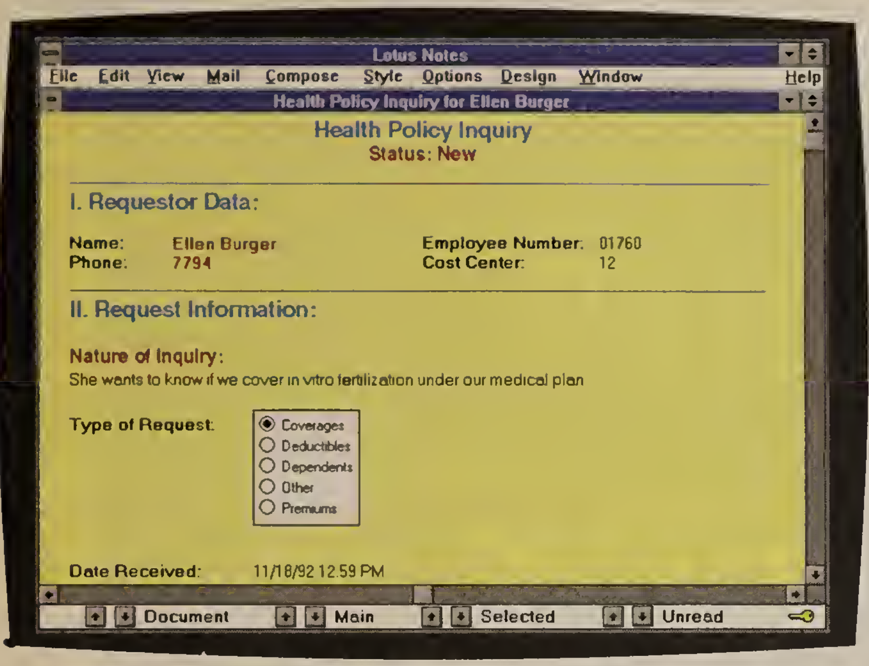
To demonstrate th
had to make an

Mike Channing
Benefits Liaison

According to critics, including our competition, Lotus Notes® is one of the most exciting software products you can buy. We'd like to show you why.

More than a development system and much more than e-mail, Notes enables users to share knowledge anytime, anywhere. With it, you can build a new class of networked applications, without special programming skills.

Let's watch how Mike Channing uses it: As a tracking tool for customer service. As a conferencing system for collaborative problem solving. And as a library for policies, documentation or news.


Lotus Notes
File Edit View Mail Compose Style Options Design Window Help
Health Policy Inquiry for Ellen Burger
Document Main Selected Unread

Health Policy Inquiry
Status: New

I. Requestor Data:

Name: Ellen Burger
Phone: 7794
Employee Number: 01760
Cost Center: 12

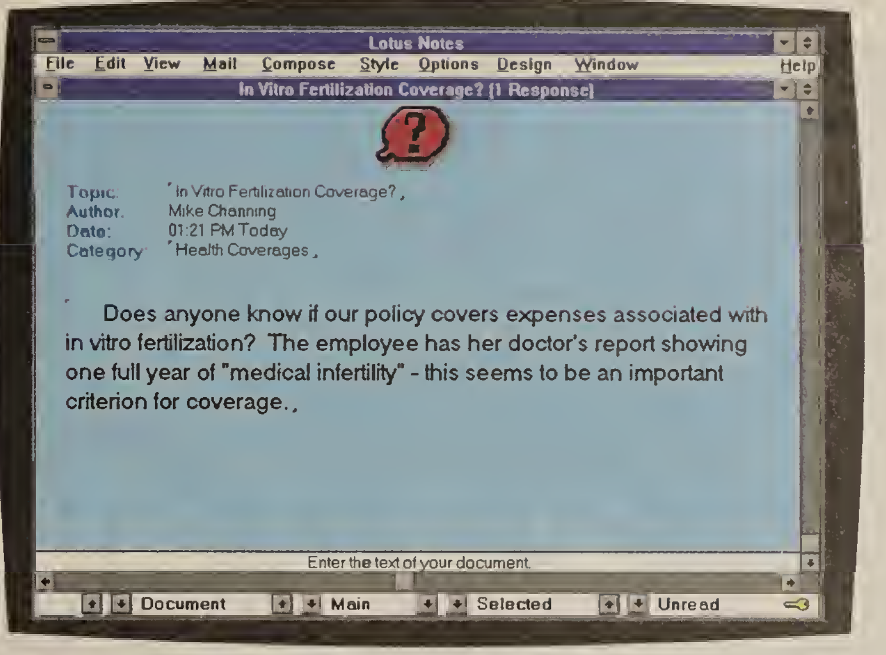
II. Request Information:

Nature of Inquiry:
She wants to know if we cover in vitro fertilization under our medical plan

Type of Request:
● Coverages
○ Deductibles
○ Dependents
○ Other
○ Premiums

Date Received: 11/18/92 12:59 PM

3. HR Inquiry Tracking Up comes the inquiry screen. Ellen wants to know if the company covers in vitro fertilization. Mike, being new, is stumped. He calls his supervisor on the phone for the answer. He's not in yet. Instead of waiting, Mike decides to post the question on the GROUP DISCUSSION database, thinking that someone else might know the answer and respond more quickly.

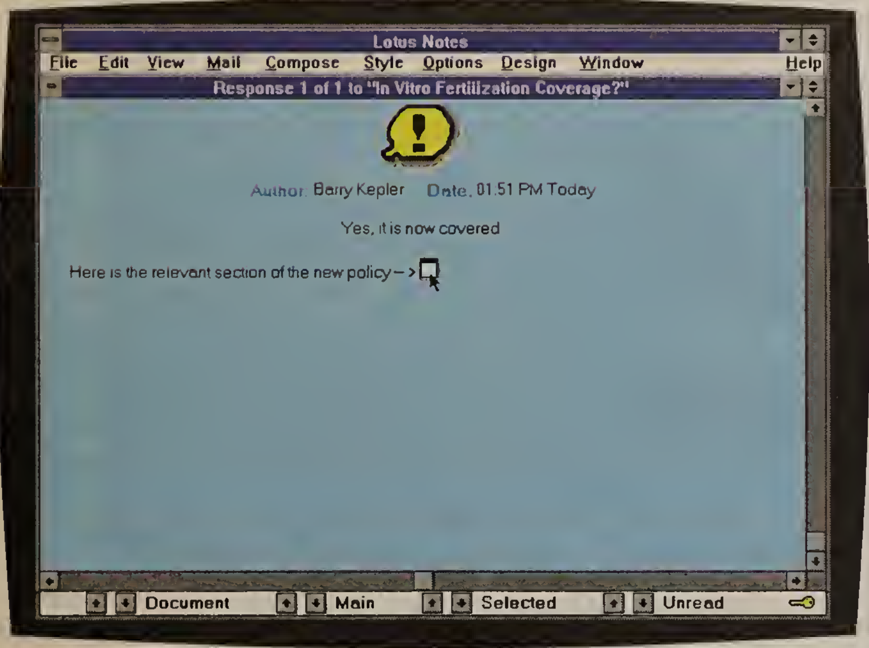

Lotus Notes
File Edit View Mail Compose Style Options Design Window Help
In Vitro Fertilization Coverage? (1 Response)
Document Main Selected Unread

Topic: ʼIn Vitro Fertilization Coverage? ,
Author: Mike Channing
Date: 01:21 PM Today
Category: ʼHealth Coverages ,

Does anyone know if our policy covers expenses associated with in vitro fertilization? The employee has her doctor's report showing one full year of "medical infertility" - this seems to be an important criterion for coverage.,

Enter the text of your document.

4. Group Discussion He double-clicks the GROUP DISCUSSION icon. Once in GROUP DISCUSSION, he poses the question to his workgroup. Eager to help, Mike then decides to check out the INDUSTRY NEWS database for any background information that might be useful to Ellen.

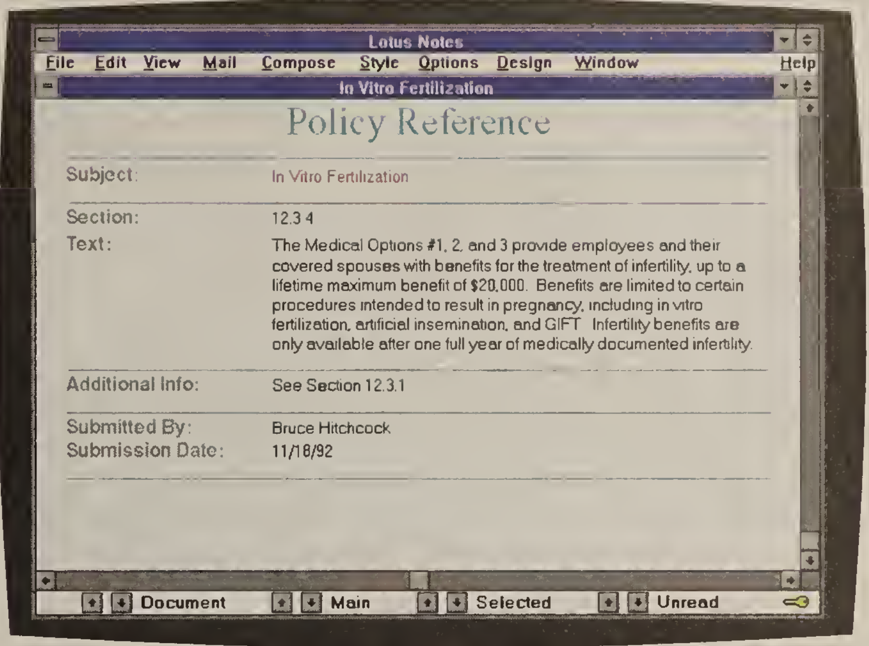

Lotus Notes
File Edit View Mail Compose Style Options Design Window Help
Response 1 of 1 to "In Vitro Fertilization Coverage?"
Document Main Selected Unread

Author: Barry Kepler Date: 01:51 PM Today

Yes, it is now covered

Here is the relevant section of the new policy – >

7. Group Discussion When he gets back to his desk, Mike checks back into the GROUP DISCUSSION database for responses. Not only has Barry Kepler responded with the answer, Barry actually leads Mike to the relevant section of the corporate policy manual by creating a direct link to the document.


Lotus Notes
File Edit View Mail Compose Style Options Design Window Help
In Vitro Fertilization
Document Main Selected Unread

Policy Reference

Subject: In Vitro Fertilization

Section: 12.3.4
Text: The Medical Options #1, 2, and 3 provide employees and their covered spouses with benefits for the treatment of infertility, up to a lifetime maximum benefit of $20,000. Benefits are limited to certain procedures intended to result in pregnancy, including in vitro fertilization, artificial insemination, and GIFT. Infertility benefits are only available after one full year of medically documented infertility.

Additional Info: See Section 12.3.1

Submitted By: Bruce Hitchcock
Submission Date: 11/18/92

8. Policy Reference Mike clicks the DIRECT DOC LINK icon. Up comes the relevant section of the policy. Mike jots a quick message and forwards both to Ellen. Job done, in less than 10 minutes, by easily tapping into expertise both inside and outside the company.

e power of Notes, we example of Mike.

Watch how Notes organizes information so it's easy for Mike to get the answers he needs. How effortlessly he taps his workgroup's knowledge. How quickly he accesses conventional references. Now you can see why people who have Notes build their work around it. And why the companies that have installed Notes have seen as much as a 400% return on their investment.*

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Lotus Notes

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*P. Blum and E. Salloway, "The Impact of Lotus Notes on Productivity," 1992

Sprint freezes plans for Multirate ISDN

continued from page 29

we won't roll out a service without that."

To use Multirate ISDN, a network device — such as a T-1 multiplexer or private branch exchange — transmits an ISDN Q.931 message that contains the telephone number of the remote site and the amount of bandwidth needed to support the user's application. The message is transmitted over the PRI link's D channel to a carrier switch.

The switch then establishes a single, contiguous pool of bandwidth across the user's carrier net and signals the network access device that the link has been established. In order to use Multirate ISDN, network access devices must have software written to an emerging Multirate ISDN specification developed by Bell Communications Research and submitted to ANSI for approval.

Adding and deleting links

The user's network device can also instruct the central office switch to add or delete switched digital links if needed. The user can add more capacity, but the existing link must first be torn down. By contrast, some inverse multiplexers can add bandwidth in the middle of the transmission.

"This is one of the drawbacks of Multirate," Schneider said. "From what we hear from users, they want the ability to dynamically add bandwidth smoothly."

Establishing a switched link with Multirate ISDN, however, can be faster than using an inverse mux. Users can set up a high-speed link with a single call, while a base model inverse multiplexer without PRI must dial up each 64K bit/sec channel separately.

But Schneider is unsure whether that alone will sell Multirate.

"Multirate is only a couple of hundred milliseconds faster than using inverse muxing," Schneider said. "That's not a big differentiator."

Furthermore, inverse muxes use noncontiguous channels to transmit data over carriers' networks; the device at the distant end of the link reorders the traffic. That can delay data delivery and increase costs because the user is charged for several low-speed connections, which costs more than a single high-speed link of equivalent capacity.

Establishing a switched link with Multirate ISDN can be faster than using an inverse mux.

▲▲▲

For example, one AT&T 384K bit/sec link costs as much as 4½ separate 64K bit/sec links.

"I don't see users ignoring that kind of savings," said Rod Randall, a founder of Teleos Communications, Inc., an Eatontown, N.J. inverse mux vendor.

Multirate compares favorably to AT&T's switched services, according to Schneider.

"With Multirate, we'll be giving users more flexibility by letting them dial up multiple switched 64-kilobit links, where AT&T only offers Switched 384 and Switched T-1," he said. ☒

MFJ issues top Congress' agenda

continued from page 29

with related issues, such as service quality and boosting competition in the local loop, by allowing rival carriers to interconnect their equipment to that of local carriers. Those issues have been overshadowed in the past, and little has been done.

"Next year, an option we're considering is to break out issues on interconnection standards and network quality from the MFJ swamp," he said.

However, Waldron was less optimistic that Congress will act on toll fraud or tariffing questions next year. He said FCC efforts so far, such as holding a daylong hearing on toll fraud in October, have convinced lawmakers the agency is taking the issue seriously.

Similarly, Congress will likely adopt a wait-and-see attitude on the FCC's tariffing rules. A federal appeals court last month ruled that the FCC's policy of allowing nondominant carriers to operate without tariffs is illegal.

"I have trouble seeing how this will have a significant impact on the marketplace," Waldron said. "It's hard to explain [to Congress] why it's bad for consumers to get more information." ☒

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Worth Noting

"Coordinating security will be one of the biggest challenges facing companies that try to provide users with seamless access to heterogeneous data sources."

John Senor
Vice-president
Information Builders, Inc.
New York

Store & Forward

Gupta Technolgies, Inc. last week announced it will ship Gupta SQLBase for UnixWare in the third quarter of 1993, as well as an application program interface that will enhance UnixWare client access to SQLBase. Gupta said it expects SQLBase for UnixWare to cost between $5,000 and $10,000.

UnixWare is Univel's family of Unix software that provides seamless access to Novell, Inc. NetWare services.

Hewlett-Packard Co. last week announced it has added an SQL interface to its TurboImage database that allows users to read and write information stored in the nonrelational database.

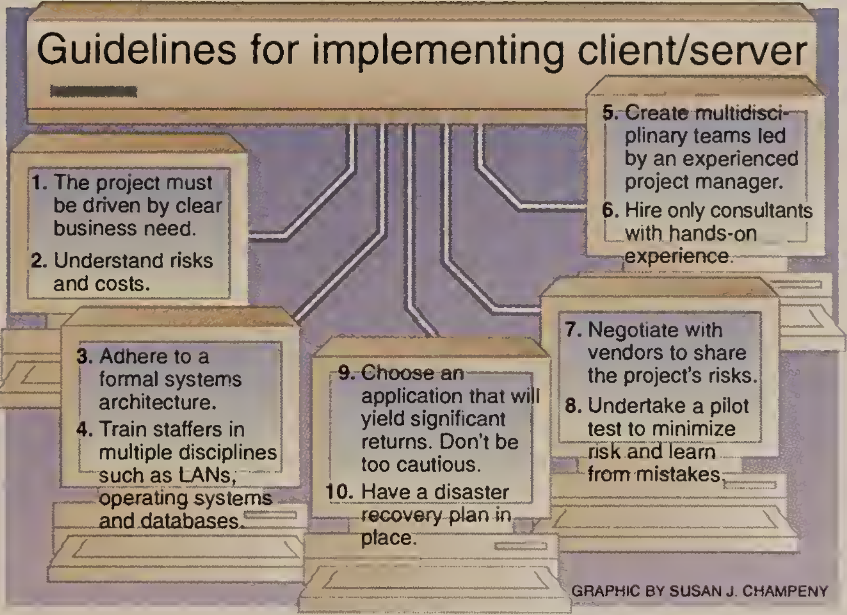
The TurboImage database has been renamed HP Image/SQL in order to reflect the upgrade.

When it becomes available in mid-1993, HP Image/SQL will support stored procedures, referential integrity and triggers, and conform to ANSI SQL standards.

No pricing information was available.

NCR Corp. and **Cincinnati Bell Information Systems, Inc. (CBIS)** last week announced the first Unix-based system for capturing im-

(continued on page 40)



Guidelines for implementing client/server

1. The project must be driven by clear business need.
2. Understand risks and costs.
3. Adhere to a formal systems architecture.
4. Train staffers in multiple disciplines such as LANs, operating systems and databases.
5. Create multidisciplinary teams led by an experienced project manager.
6. Hire only consultants with hands-on experience.
7. Negotiate with vendors to share the project's risks.
8. Undertake a pilot test to minimize risk and learn from mistakes.
9. Choose an application that will yield significant returns. Don't be too cautious.
10. Have a disaster recovery plan in place.

GRAPHIC BY SUSAN J. CHAMPENY

DG offers electronic mail, groupware for WordPerfect

Lets Unix users exchange messages and tasks.

By Timothy O'Brien
West Coast Bureau Chief

WESTBOROUGH, Mass. — Data General Corp. last week announced AV Office Mail, an electronic mail and scheduling program targeted at users of WordPerfect Corp.'s word processing software.

Based on the company's AV Office product suite, AV Office Mail gives WordPerfect users integrated E-mail and time management capabilities.

> Users can mail WordPerfect documents to any AV Office Mail user in one step.
>
> ▲▲▲

"AV Office Mail is ideal for users that want to extend their WordPerfect functionality by improving their group communications," said Bill Zastrow, DG's vice-president of open office systems.

Support and compatibility

The product is interoperable with DG's other AV Office Information System products and runs on DG's AViiON workstations.

According to the company, a single Unix system can support as many as 500 users. When employed with DG's CEO Mail Gateway, AV Office Mail users can communicate with CEO Mail users on Eclipse MV systems.

The software includes options such as file certification, registration, confirmation, reply requests, prioritized messaging and file forwarding. Other features include autoreply, autoforward, mail status checks, mail archiving, attachments of any file type and multiple file support. Passwords and encrypted messages are also provided to ensure user security.

One-step messaging

Users can mail WordPerfect documents to any AV Office Mail user in one step. They can also view, reply to or file WordPerfect documents from the AV Office Mail inbox. In addition, users are alerted to new messages while editing WordPerfect documents.

The AV Office Mail Time Manager is a personal and group scheduler that allows users to schedule appointments, conferences and facilities, create personal calendars organized in daily, weekly or monthly formats and graphically display scheduled and open times.

Personal productivity tools allow AV Office Mail users to create to-do lists, reminders and alarms. A systemwide on-line help facility is included. Systems administrators can customize the user interface to add or remove menu options from AV Office Mail's main menu.

AV Office Mail is available now. It is priced from $225 for a single user to $150 per user for more than 50 users.

Replication, naming added to NetWeave

Connectivity software enhanced with offerings to make distributed apps more reliable, extensible.

By Timothy O'Brien
West Coast Bureau Chief

WILMINGTON, Del. — The Sombers Group, Inc., a vendor of middleware software, is looking to add next year a replication data facility and naming services to its multiplatform, multiprotocol NetWeave connectivity software.

The enhancements will facilitate the deployment of distributed applications, making them more reliable and extensible by improving updating and management functions.

Running between the operating system and applications on any machine from the personal computer to the host, NetWeave provides users with a way to transparently access applications and databases distributed across a heterogeneous network.

Platforms supported by NetWeave include systems from Digital Equipment Corp., Hewlett-Packard Co., IBM, Stratus Computer, Inc. and Tandem Computers, Inc., as well as Apple Computer, Inc. Macintosh, DOS, Microsoft Corp. Windows and Unix workstations. In 1993, IBM Application System/400 support will be added.

NetWeave platforms can be linked by using a wide range of protocols, including the Transmission Control Protocol/Internet Protocol, Network Basic I/O System and AppleTalk on local-area networks, and TCP/IP, LU 6.2, X.25 and asynchronous communications over wide areas.

Introduced in 1988, NetWeave is built on a client/server architecture, allowing client applications on various platforms to access and update remote server data. The data may be located in either proprietary file systems or SQL databases.

In this model, NetWeave hides

(continued on page 40)

Matesys, IBI unite to boost ObjectView database access

By Wayne Eckerson
Senior Editor

CHICAGO — Matesys Corp. last week extended the reach of its ObjectView Windows-based SQL development tool to scores of mainframe databases through an alliance with Information Builders, Inc. (IBI).

Matesys also announced shipping dates for a work group edition of ObjectView that supports an object repository and support for COBOL and FORTRAN programming languages.

The deal with IBI lets Matesys add support for IBI's Enterprise Data Access (EDA)/SQL connectivity software to ObjectView 2.0, providing access to 50 relational and nonrelational data sources on 35 platforms, including IBM's IMS, VSAM and other host databases.

This broadens the product's support of mainframe and proprietary data sources, said Marc Pinotti, director of marketing at Matesys. ObjectView 2.0 currently provides access to SQL databases, such as Oracle Corp.'s Oracle Server and Sybase, Inc.'s SQL Server. It also supports the Open Database Connectivity standard for accessing SQL databases.

"Many Windows developers are looking for tools that give them access to the bulk of enterprise data, which still resides in host databases," Pinotti said.

ObjectView 2.0 runs on OS/2, Windows and Windows NT, and will support EDA/SQL in the first quarter of next year, he added.

To complement the standalone version, Matesys also disclosed it will ship in February the Work Group Edition of ObjectView 2.0, which will let multiple programmers share objects in a network environment.

The Work Group Edition contains an SQL-based repository that stores objects built by developers using ObjectView 2.0. The

(continued on page 40)

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THE PAINLESS PILGRIMAGE FROM ANALOG TO DIGITAL

Model	Type	Max. Rate	Network	Features
SW56II	Accunet Sw. Digital	56 Kbps	4-wire Sw. Digital	Keypad, Autodialer
DU170	Datapath Sw. Digital	64 Kbps	2-wire Sw. Digital	Keypad, Autodialer
TA110	Terminal Adapter	1 Ch. @ 64K 1 Ch. @ 16K	ISDN	X.25 PAD
TA120	Terminal Adapter	2 Ch. @ 64K 1 Ch. @ 16K	ISDN	Supports Voice & Data
TA220	Terminal Adapter	2 Ch. @ 64K 1 Ch. @ 16K	ISDN	Combines "B" Channels
FT100S	DSU/CSU	56K-1.544Mb	T1/ Frac. T1	Single Port
FT100	DSU/CSU	56K-1.544Mb	T1/ Frac. T1	Dual Port (Expandable)
DDS/MR1	DSU/CSU	56 Kbps	DDS	All DDS Rates
DDS/V.32	DSU with V.32 Modem	56 Kbps	DDS/ Analog	Auto-dial Backup
T1-ESF-CSU	CSU	1.544 Mbps	T1	ESF & D4 Framing
Digital-DBU	Digital Dial Backup	56K-1.544Mb	DDS/ Frac. T1	Universal Digital Dial Backup

Sooner or later, you've got to make the move from analog to digital for your data communications. And contemplating the trip is a little spooky.

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Every pilgrimage is easier with a reliable guide, so save yourself the stress, the false starts, the unnecessary expense. As you go digital, look to UDS for applications expertise, reliable products and competitive pricing. Call:

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS, ALLIANCES AND FINANCIALS

Worth Noting

> "The computer industry has reviled connection-oriented services as the work of the devil."
>
> **Bryan Lyles**
> Research staff member
> Xerox Palo Alto Research Center
> Palo Alto, Calif.

People & Positions

Network Equipment Technologies, Inc. (NEC), a Redwood City, Calif., multiplexer vendor, last week named **Thomas Cooper** vice-president of distribution, a newly created position. He will be responsible for developing the direct and indirect distribution strategies for the sale of the company's ATMX product.

Previously, Cooper held the position of senior vice-president at Strategic Management, a consulting unit of Rubloff, Inc.

NET also announced the promotion of **Robert Crane** to vice-president of sales operations. In addition to his current responsibilities as director of sales operations, he will provide support for the company's marketing alliance partners.

Additionally, NET recently expanded its international staff to include a new vice-president of sales and three new regional managers.

Marlin Nelson has been named vice-president of sales for Europe, the Middle East and Africa, and will be responsible for product sales through both direct and indirect international channels. The new managers are: **Andrew Gilbert**, sales manager for the U.K.; **Gerhard Unger**, sales manager for Central Europe, including Germany and Eastern Europe; and **John Smith**, systems engineering manager for Europe.

Where open systems stand

Technology	Systems and network management	Application management	Distributed backup and restore	Distributed security
Current state of market	Many stable standards, some implementation	Little standardization, low level of implementation	Some standardization, some implementations	Some standardization, some implementations
Supply growth	Significant in 1993 and future	Maximum development in 1994-1995	Some growth in 1993-1994 but from a low user base	Growth starting in 1993
Purchasing outlook	More stable environment from 1994	Direction clear in the longer term	No clear direction evident	Clear market direction
Commitment level	88% of vendors committed	70% of vendors committed	48% of vendors committed, room for user action	70% of vendors committed
Principal standards supported in 1995	33% formal standards, 30% consortia specifications, 25% IETF RFCs	Consortia specifications will dominate	Little or no clarity	Consortia specifications will dominate

X/Open polled 65 vendors with combined information technology sales of more than $220 billion. The survey sought to determine the availability of interoperable products, whether they are based on standards, consortia specifications or the Internet Engineering Task Force's (IETF) requests for comments (RFC).

SOURCE: X/OPEN COMPANY, LTD, MENLO PARK, CALIF.

X/Open draws up 1993 interoperability road map

X.500 a safe route; data mgmt. a bumpy ride.

By Ellen Messmer
Senior Correspondent

MENLO PARK, Calif. — X/Open Company, Ltd. has laid out a road map showing where progress is being made on interoperable network products.

At its recent Xtra World Congress user conference in Washington, D.C., the vendor consortium presented the results of the first "X/Open World Survey of Suppliers' Plans for Open Systems." The survey examined where vendors stand in terms of delivering products based on standards, Internet Engineering Task Force requests for comments and industry consortium specifications.

The survey of 65 vendors concluded that users will be able to safely invest in X.500 directory services products next year but warns that the area of data management remains unclear. Open distributed transaction processing is also poised for growth next year, but a lack of standards will hold back application management products. That market is not expected to take off before 1995.

The open systems consortium, which commissioned market research firm Dataquest, Inc. to gather the data, said the survey will help users identify technology areas where openness is more prevalent. The group also hopes to foster realistic user expectations about the availability of open products and standards.

What's stable?

The survey categorizes a wide range of technologies as stable, nearly stable and unstable. The stable group, which includes file-transfer and virtual terminal services, is characterized by an abundance of standardized products.

In the nearly stable arena — which includes directory services, electronic messaging services, remote operations and network windowing services — standards and products have started to emerge.

Distributed transaction processing narrowly makes this group with an international standard for Transaction Processing approved in June, promising an increase in product availability by the end of next year.

Open systems and network management standards are also firming up, but real product growth may not come before 1994 (see graphic, this page).

In the unstable category, users are cautioned that few standards

(continued on page 40)

Transarc and Retix push for open OLTP

IBM to join with companies to demo its support; firm will run OSI/TP with CICS apps on RS/6000.

By Bob Brown
Senior Editor

Transarc Corp. and Retix last week announced an alliance under which Transarc's Encina transaction processing monitor (TPM) will be integrated with Retix software based on emerging OSI protocols for interoperability among TPMs.

That would enable on-line transaction processing (OLTP) applications running under Encina to work with applications based on monitors from other vendors that have committed to supporting the Open Systems Interconnection/Transaction Processing (TP) protocols. NCR Corp. and Unix System Laboratories, Inc. have already announced plans to support OSI/TP.

In a related announcement, IBM said it will join Retix and Transarc next year to demonstrate the use of OSI/TP with IBM CICS applications running on an IBM RISC System/6000. Few other details were available about the demonstration, and IBM officials were unavailable for comment.

Terms of the Retix-Transarc development and marketing agreement call for the companies to jointly market Retix's Communication Resource Manager software bundled with Encina, said Alex Rassey, a product manager at Retix, which is based in Santa Monica, Calif.

Encina is based on the Open Software Foundation, Inc.'s Distributed Computing Environment, which provides services supporting distributed computing in heterogeneous nets.

John Schiller, Encina product manager at Transarc, which is located in Pittsburgh, said OSI/TP provides the lowest common denominator for communication among multiple vendors' transaction monitors.

Roy Schulte, a vice-president in the software management strategies practice of Gartner Group, Inc., a Stamford, Conn., market research firm, said

(continued on page 40)

INDUSTRY BRIEFS

UB offers users EDI. Ungermann-Bass, Inc., a Santa Clara, Calif., local-area network and internetwork equipment vendor, last week announced it will begin letting users order products via electronic data interchange. EDI provides for faster product delivery and reduced errors in order processing. UB expects to have a minimum of 12 active EDI customers by the end of 1993.

For more information, contact UB at (800) 777-4526.

WilTel pulls fast one. FastComm Communications Corp., a Sterling, Va., data communications equipment maker, has signed an agreement with Tulsa, Okla.-based WilTel to provide frame relay equipment for WilPak, the carrier's frame relay public network.

UB reorganizes overseas. Ungermann-Bass, Inc. announced it is reorganizing its European operations by phasing out its European headquarters in Chamberley, England, in order to create two new regional centers by early next year. The London-based southern region center, managed by Vice-President Graham Gough, will handle marketing and distribution operations in the U.K., Denmark, Finland, Norway and Sweden. The southern region center, whose location and manager are still to be announced, will serve Belgium, France, Germany, Italy, the Netherlands, Spain and Switzerland.

SunConnect plots move to France, woos int'l users

By Bob Brown
Senior Editor

MOUNTAIN VIEW, Calif. — SunConnect, Sun Microsystems, Inc.'s networking products business unit, last week announced plans to move its headquarters from here to Grenoble, France, to attract and better serve users with major operations in Europe.

The move is also designed to enable SunConnect to work more closely with European vendor partners and to focus on technologies, such as Integrated Services Digital Network, that are further along overseas.

SunConnect, which is responsible for the SunNet Manager net management platform as well as a variety of communications software offerings, currently conducts 50% of its business in the U.S. and 30% in Europe.

The move will not result in any loss of service to SunConnect's customers based in the U.S., said Denis Yaro, who will head to Grenoble by mid-1993 as general manager of SunConnect and vice-president of Sun. The move will involve Yaro's senior executive team and staff, as well as marketing, product development and engineering personnel, but a parallel organization will remain in the U.S., he said.

Several SunNet users — which had yet to be briefed on the move by SunConnect — said they doubt the move will affect them much.

Sun set up a net research facility in Grenoble more than two years ago that has since come under the auspices of SunConnect, which was formed last year. The facility is responsible for about one-third of SunConnect's research and development efforts, Yaro said.

Currently, the Grenoble facility works to develop products based on various Open Systems Interconnection standards, such as X.25, ISDN and the Common Management Information Protocol (CMIP), according to Jean-Pierre, Baudouin, engineering director of worldwide networks for SunConnect. Other technologies will be considered in the future.

To some degree, SunConnect's move mirrors IBM's relocation of its communications division to the U.K. to emphasize international networking.

Denis Yaro

Jeff Thiemann, HP's OpenView marketing program manager, said SunConnect's move to France is good news for his company from a competitive standpoint. SunConnect could wind up with some product scheduling challenges during the transition and may also find itself diverting substantial resources away from things that are big in the U.S. toward supporting emerging and well-accepted European standards, he said.

According to a SunConnect spokesman, SunConnect already has work under way in both of those areas, though she declined to provide availability details.

Vendors push for open OLTP

continued from page 39

OSI/TP support likely will be available on all the major transaction monitors by mid-1993.

Transarc is partnering with Retix because "it's the fastest way for Transarc to support OSI/TP and will save Transarc on development," he added.

The Unix-based transaction monitor market is due to explode over the next few years. The market, including hardware and software, will grow from about $210 million this year to about $3 billion by 1995. The growth will be fueled by users building OLTP applications on workstations rather than higher end systems, Schulte said. Availability of OSI/TP software will, at least in part, fuel that growth.

Harvey Hindin, a vice-president at Emerging Technologies Group, Inc., a Long Island, N.Y., consulting firm that specializes in open systems, said the Retix-Transarc announcement is "a good step toward giving [users] an open systems-based environment. Right now, you've really got to buy stuff from only one vendor."

Pricing and availability for the Retix-Transarc product is not available yet.

Store & Forward

continued from page 35

ages of bank checks.

The two companies ported CBIS' mainframe-based ImageBanc imaging system to NCR's 3550 Unix platform.

The first customer of the Unix version of ImageBanc is Mutual Services, Inc., a Boston-based provider of data processing services to banks.

EcoSystems Software, Inc. last week began shipping a suite of client/server management tools that provide mainframe-caliber management of distributed Unix systems, including networks, applications and hardware.

The initial version of the tools manages client/server platforms running Oracle Corp.'s Unix database.

Pricing for the tools starts at $16,000.

Sterling Software, Inc.'s Dylakor division last week announced a February shipment date for its data access tools that let workstation users access data on IBM mainframes.

Sterling's Answer/Server is software that resides on MVS mainframes running CICS, TSO or IMS/DC.

It provides DOS and Windows clients with access to a dozen mainframe data sources, including VSAM, DB2, IDMS and others, and has optional client interfaces to Unix and Tandem Computers, Inc.'s Guardian.

Sterling also announced a February shipment of Journey for Windows, which provides Windows clients with access to mainframe data via the company's Answer/Server data access server. Journey for Windows converts mainframe data into different formats for insertion into Windows applications.

Answer/Server ranges in price between $26,000 and $134,000, while Journey for Windows costs between $7,350 and $25,900.

Rochester Software Connection, Inc. recently announced a PC-to-AS/400 connectivity tool dubbed ShowCase ODBC.

The new product lets Windows 3.0 applications access data on IBM Application System/400 mid-range computers via Microsoft Corp.'s Open Database Connectivity application program interface.

ShowCase will be available in the first quarter of next year and will carry a price tag of $495 per user.

X/Open draws up '93 road map

continued from page 39

or standard implementations exist at this time. While some growth is predicted to occur after 1994, there is no clear market direction or vendor commitment for these areas.

X/Open put distributed security services and data management in that category. The survey stated that the management of multiple data types, such as images and multimedia, has not enjoyed much standardization to date. The X/Open survey urged users to "exert influence on the industry to deliver open products in this area."

For more information about the study, call X/Open at (415) 323-7992.

Matesys, IBI boost ObjectView

continued from page 35

repository — which runs on any SQL database, such as those from Oracle, Sybase and Informix — makes it possible for multiple ObjectView programmers to share and reuse objects.

The Object Repository supports version control and allows programmers to specify the level of inheritance objects will support. Object definitions are written in ASCII so that computer-aided software engineering and other tools can be easily integrated with the repository, Pinotti said.

Finally, Matesys plans to add support for COBOL and FORTRAN programming languages to ObjectView 2.0. This will make it easier for users to migrate COBOL mainframe applications to a client/server platform that supports a graphical user interface.

ObjectView currently allows programmers to build application code using C, C++ or Matesys' ViewScript fourth-generation language.

Pricing for ObjectView 2.0 ranges from $1,799 to $2,999 for the Work Group Edition.

Replication added to NetWeave

continued from page 35

the complexity of the heterogeneous network from the application programmer, who can use a single system environment to develop a multiplatform application.

NetWeave only requires programming at the level of a client application, meaning programs can read, write and update records in any remote server file as if they are stored locally.

Since the client and server application program interfaces are common across all platforms, NetWeave can also operate symmetrically. In other words, a platform can act as both a client and server. For instance, a Macintosh client can access data on a DEC VAX server as easily as a Unix server can update PC data.

The addition of the replication data facility next year will give users a way to update application transactions more effectively in a distributed environment. By performing updates through periodic replication of data, rather than traditional methods such as two-phase commit, users can minimize network traffic when applications are running.

In a similar way, naming services will assist users in implementing distributed applications. Through a naming scheme that is employed on a range of platforms, users can locate and manage data and resources more easily in an enterprise network.

To provide multiuser access to the network, NetWeave uses a set of remote procedure calls (RPC) that provide developers with data query and update capabilities as well as peer-to-peer interprocess messaging services used for linking applications across the various platforms.

Beyond RPCs, several additional utilities, including file transfer and remote printer spooling, are built on top of the basic NetWeave services.

According to Bill Highleyman, chairman of The Sombers Group, NetWeave will be compliant with all applicable operating system and protocol standards as they emerge.

For example, he said NetWeave will be offered as a set of published services to run in the Open Software Foundation, Inc.'s Distributed Computing Environment (DCE) using the DCE RPC rather than NetWeave's existing proprietary RPCs.

In addition, Highleyman said NetWeave will support the SQL language semantics specified by the SQL Access Group, an industry consortium focused on setting database standards. NetWeave will also support X/Open Company, Ltd.'s XA interface, which will enable NetWeave clients to coordinate transactions across multiple servers.

NetWeave server licenses are priced at $12,500, with quantity discounts available for five or more licenses. Client licenses begin at $9,000 per group of 20 workstations and are discounted down as low as $90 per workstation in larger quantities.

Worth Noting

"Being a close follower instead of a leading-edge user is both a blessing and a curse. The curse is the cost you have to incur to catch up; the blessing is that you are not restricted by previous investments."

Chuck Papageorgiou
Network administrator
United Parcel Service, Inc.
Paramus, N.J.

Manager Minutes

The **International Communications Association (ICA)** has announced that Rolm, a Siemens company, will sponsor the 1993 ICA Foundation Student Paper Competition.

The program is designed to recognize the brightest concepts emerging from graduate and undergraduate telecommunications programs at more than 30 universities. The ICA Outstanding Student of the Year Award will be presented to the winner of the graduate competition at the upcoming ComNet show, scheduled for May 16-20. For more information, contact ICA at (214) 233-3889.

The Conference Board, Inc. and **Gartner Group, Inc.** are jointly sponsoring the 11th Annual Information Management Conference, called "Managing Information Technology for Payoff," Feb. 23-24 in New York. The conference will help better evaluate the contribution of information technology to the corporate bottom line.

The conference costs $845 for associates and $995 for nonassociates. For more details, contact The Conference Board at (212) 339-0290. ◘

1993 salary outlook for the nation's computer/information systems industry

Management level	U.S.	Northeast	Midwest	Southeast	Southwest	West Coast
CIO/vice-president	$107	$130	$102	$101	$101	$100
IS director	$75.5	$87.7	$72.7	$68.7	$68.6	$75.5
Manager of systems analysis and programming	$64.9	$72.8	$63.7	$59.2	$60.9	$64.6
Manager of systems programming and technical support	$61.8	$73.1	$61.1	$55.9	$54.3	$61.3
Network manager for LAN/WAN	$57.4	$60.3	$55.8	$59.1	$53.3	$55.9
Systems analyst/programmer/ project leader	$53.2	$59.2	$52.6	$51.1	$48.1	$53.2
Database administration manager	$62.4	$67.1	$62.8	$60	$61.8	$57.8
Telecommunications manager	$62	$68.1	$60	$55	$66.1	$59.5

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: NATIONAL COMPUTER ASSOCIATES, SAN OIEGO

Net managers, software engineers in high demand

Survey results: High-tech salary increases expected.

By Joanne Cummings
Senior Writer

SAN DIEGO — Software engineers and network managers are expected to land the best jobs available in the high-technology industry next year and will probably pull in salary increases averaging 3% to 8% better than the industry as a whole, according to a recent survey.

The poll, conducted by National Computer Associates (NCA), a group of computer recruitment and placement firms in the U.S., Canada and the U.K., also found that programmer/analysts, computer analysts, operating system programmers, and database analysts and administrators will be high on the talent shopping lists of many companies.

Employers surveyed said they expect to offer these high-tech professionals salary packages 6% to 10% higher than 1992 levels, well above the 2.8% increase projected for the industry as a whole in 1993.

The survey was based on data gathered from more than 1,800 firms of all sizes and in every industry group, according to Robert Morrison, president of NCA and head of Technical Directions, Inc., an NCA member firm here.

Morrison said the survey responses indicate that the largest salary increases will be offered by such firms as computer software and consulting firms, financial and brokerage concerns, banks, manufacturing companies and health care organizations.

Geographically, he said, the survey found that 1993 salary increases will be strongest in the Midwest but relatively weak on the coasts. This is balanced, however, by the fact that firms on the coasts generally offer higher salaries to begin with because their cost of living is higher (see graphic, this page).

The two cities offering the highest salaries for computer professionals are New York and San Francisco, according to the study.

In addition, the survey found that experience enters the equation, with workers averaging two to seven years of experience garnering the greatest demand and salary increases in 1993. Also, it found that management-level professionals will also earn larger than average 1993 salary increases, although executive-level bonuses are likely to shrink somewhat, Morrison said.

> Employers surveyed said they expect to offer high-tech professionals salary packages 6% to 10% higher than 1992 levels.
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For more information or a copy of the survey, write to Morrison at Technical Directions, Suite 1025, 8880 Rio San Diego Drive, San Diego, Calif. 92108, or call (800) 367-1017. ◘

MANAGING TECHNOLOGY

BY DAVID FERRIS

A look at mail-enabled applications

Today's mail-enabled applications are fairly simple, but by 1997, they should become more complex and offer big payoffs to users implementing them strategically.

Of the six main types of mail-enabled applications used today, the most widely utilized are report distribution applications, according to a recent survey conducted for a forthcoming Ferris Networks study. These save on information overload by distributing reports, such as spreadsheets or word processing documents, over electronic mail.

Next are mail management applications, which are specialized utilities that compensate for deficiencies in the mail system. For example, some users have customized IBM's Professional Office System so that an absent worker's mail can be forwarded automatically to a coworker.

Among the lesser used mail-enabled applications are user notification applications, which are programs that generate a lot of information and employ E-mail to disseminate it to users in a timely way.

Another is common user interface applications, which let users access unfamiliar systems, such as a database, employing an interface they know, namely their E-mail system. These are sometimes augmented with an integrated forms capability.

The fifth, work flow applications, automate business processes that involve different people working together. One example is utilizing the mail system to forward an expense form that needs to be approved by different departments.

Store-and-forward processing is just like traditional online transaction processing systems, except that the processes involved are naturally asynchronous rather than interactive.

An example of this is a sales support system. For instance, a food processing company allows sales agents to prepare sales calls by submitting requests about the client's buying habits to an E-mail box. Another program picks this up, accesses a mainframe database and returns the information by E-mail in spreadsheet form.

This mix of mail-enabled applications will change substantially over the next few years.

By 1997, as application developers become more familiar with the technology involved, store-and-forward transaction processing applications will predominate, followed closely by common user interface, user notification and report distribution applications. Mail management utilities will be the exception because, by that time, vendors will have filled in most of the gaps.

The tools for building these applications will change in popularity, as well. Currently, there are four types of tools available.

With file format application program interfaces (API), the programmer communicates with the mail system by creating a file containing the data needing to be sent, as well as the destination address and other E-mail parameters. When the file is placed in the appropriate mail directory, the mail system handles the transport. Examples of this type of system are cc:Mail, Inc.'s (a division of Lotus Development Corp.) cc:Mail Import/Export and Microsoft Corp.'s MS Mail File Format API.

Using function-call APIs, programs access the mail system via traditional computer programming, similar to calling a subroutine. Examples of such APIs are Vendor Independent Messaging, Microsoft's Messag-

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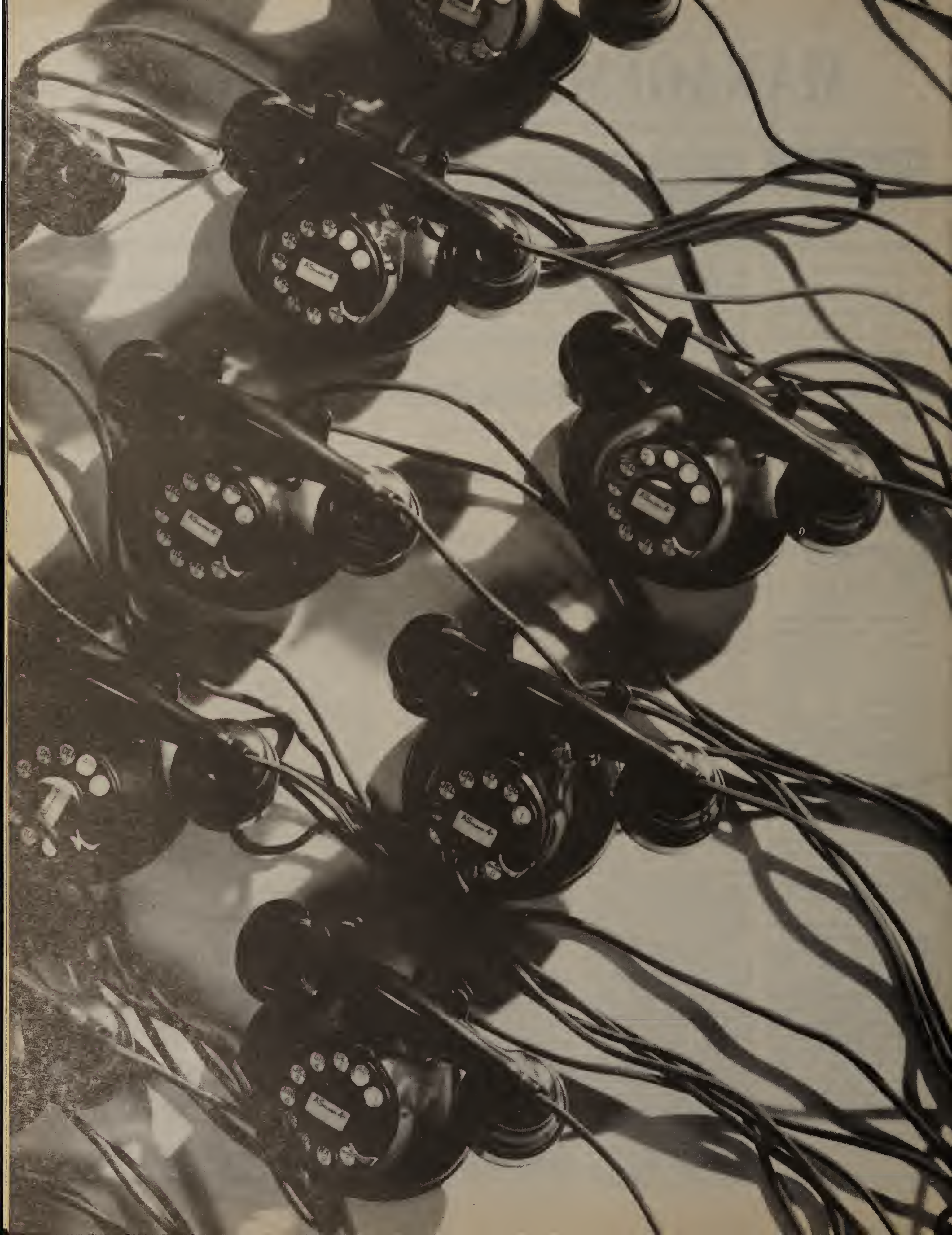

Hardware comes and goes. Fiber is forever.

The most important decision you'll have to make in planning your premises communications network might not be choosing a telephone system or other high-visibility hardware. It could well be choosing the right optical fiber.

Constant design changes often make this year's computer, fax machine or PBX obsolete within a few years.

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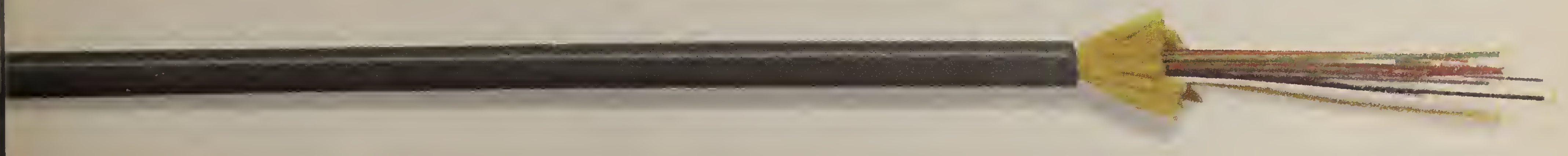


CORNING

Circle Reader Service #45

OPINIONS

POLICY-MAKING

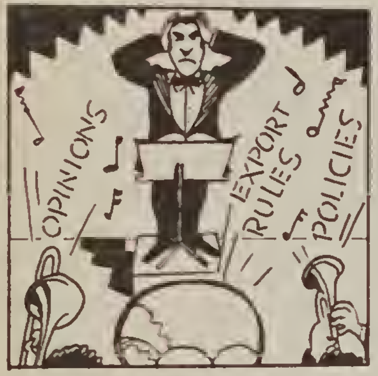
BY STUART BROTMAN

Clinton has chance to play leading role in communications

Throughout the campaign, both President-Elect Bill Clinton and Vice-President-Elect Al Gore advocated that the government play a strong role in improving our nation's infrastructure — including the electronic highways that transmit voice, data and video. They also spoke forcefully about opening up foreign markets to high-technology exports.

Our country's communications policy-setting system needs to be revamped if Clinton and Gore are to meet these goals. The U.S., led by the president, must speak with one voice on communications matters.

But we are at a serious competitive disadvantage because the Federal Communications Commission and several dozen executive branch agencies — including the Department of Justice, the Department of State and the Department of Commerce — claim some measure of turf rights in communications policy. At various times, each represents itself to the nation or the world as our country's communications spokesperson.



It was nearly two years, for example, before President Reagan intervened between the battling State and Commerce departments to announce the decision that the U.S. would be best served by competition in the international satellite market. Until Reagan stepped in, no one in this country or abroad could understand exactly who was speaking on behalf of the U.S. Both departments were in fundamental agreement that competition would be beneficial; they just couldn't agree which one would make the announcement.

This is in sharp contrast to the major industrial powers of Europe and Japan. Although these countries have vigorous internal debates about communications policy, each has a powerful coordinating entity that can bring key issues to its political leadership for a decision.

This is not to suggest we emulate the structure used in most other industrialized nations. Our policy is too diverse to tolerate such top-heavy decision making. Moreover, this centralized model didn't work when it was in place during the early 1970s under President Nixon. Back then, the White House Office of Telecommunications Policy failed in its mission because it was too close to the center of power.

A better way to enable the U.S. to speak with one voice on domestic and international communications issues is to create an expert working group on communications within the Executive Office of the President. Under Clinton's proposed White House reorganization plan, this group could be made part of the Economic Security Council, which will comprise key Cabinet members and be headed by a presidential assistant with ready access to the Oval Office. This would ensure that communications issues would be brought to Clinton's attention for timely decision making.

The Clinton administration has the opportunity to make its mark here, particularly in the early days when ideas about White House reorganization are most likely to take hold.

Brotman is a Boston-based communications lawyer and management consultant.

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Bob Wallace — Global Services

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5423 Gladewright Drive
Centreville, Va. 22020
Phone: (703) 266-1537
Fax: (703) 266-1543

Senior Editors
Jim Duffy — Data Net Architectures
Michael Cooney — Data Net Architectures
14701 Bentley Square
Centreville, VA 22020
Phone: (703) 830-8138
Fax. (703) 830-7963

Senior Writers
Joanne Cummings — Management Strategies
Reader Advocacy Force Coordinator
67 Highgate Road
Marlborough, MA 01752
Phone: (508) 481-6061
Fax: (508) 485-5809

Maureen Molloy — Internetworks

Staff Writer
Skip MacAskill — Internetworks

West Coast Bureau
Timothy O'Brien
Bureau Chief/Enterprise Applications
2088 Union Street, Suite 2
San Francisco, Calif. 94123
Phone: (415) 771-3530
Fax: (415) 771-2817

Washington D.C. Bureau
Anita Taff
Bureau Chief/Global Services
Phone: (202) 879-6744

Ellen Messmer — Senior Correspondent
National Place
1331 Pennsylvania Ave. NW, Suite 505
Washington, D.C. 20004
Phone: (202) 879-6752

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Network World
161 Worcester Road
Framingham, Mass. 01701
(508) 875-6400
MCI Mail — 390-4868
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Hughes LAN Systems, Inc.
Jane Videtich
President, International Communications Association
Systems Development Manager, R.J. Reynolds Tobacco Co.
Stanley Welland
Manager, Corporate Telecommunications
General Electric Co.
Ronald West
President, Association of Data Communications Users
Manager of Telecommunications and Office Automation,
Shearman & Sterling

EDITORIAL

Hey, buddy, wanna buy a high-speed LAN?

If you're looking for a good deal on a high-speed local-area network, now's the time to talk to FDDI vendors.

"What?" you say. "I've read the papers and Asynchronous Transfer Mode (ATM) or 100M bit/sec Ethernet will obsolete 100M bit/sec Fiber Distributed Data Interface."

Well, that just may be. ATM is coming on strong — if not in actual products, then certainly in industry attention. Ditto for 100M bit/sec Ethernet.

But the reality is that those LAN options won't be pervasive anytime soon (see "The fastest gun in the LAN world," page 49). Standards work has to be completed and suppliers have to deliver real, cost-effective products that can interoperate in a multivendor environment before these technologies can make serious inroads.

Meanwhile, there are a variety of interoperable FDDI products on the market today, and the good news is prices are coming down. Case in point: Crescendo Communications, Inc. offers a twisted-pair adapter for personal computers for less than $1,000. That's still pricey but not bad when you consider that IBM gets more than $800 for a 4M/16M bit/sec token-ring adapter.

The better news is that FDDI vendors are scared right now. With ATM and the new Ethernet looming on the horizon, they know now is the time to grab market share, and they're ready to talk deals.

All of us face the danger of getting hypnotized by emerging technologies — like a deer frozen in the headlights. With ever-faster LAN alternatives on the horizon, it can be easy to delay a purchase decision. The trick is determining just where you are on the need curve.

If you can push your installed LANs further, it might make sense to hold off while the ATM and 100M bit/sec Ethernet markets take shape. But if your current Ethernets and token rings are maxed out and end users are clamoring for more bandwidth for client/server or multimedia applications, you can probably cut a pretty neat deal on an FDDI network today. And ATM, at least, will still offer plenty of options for the future.

OPINIONS

SUPPORT ORGANIZATIONS

BY MARY JOHNSTON TURNER

A good support strategy yields distributed computing benefits

Users won't gain the long-awaited benefits of distributed computing until they settle staffing and support issues. Without effective support strategies, distributed computing nets risk becoming less reliable than the mainframes they are replacing. Costs to support the new networks can skyrocket if staffing solutions are implemented in an ad hoc fashion.

It is the staffing issue, not the technical issues, that causes many managers to lose sleep at night. They toss and turn, wondering how to staff distributed computing support groups, properly define responsibilities and boundaries, and determine if the support group is operating cost-effectively.

Unfortunately, the staffing and support of distributed computing networks is a new field. Benchmarks that help managers grade organizational efficiency and effectiveness in such environments are few and far between. Such benchmarks for mainframe-based organizations have long existed, providing guidelines for the required numbers of operators, software developers, help desk, field technicians and supervisory staff needed to support a computing environment.

During the last year, several private and industry association efforts have begun to put together distributed computing network management benchmarks. Two major challenges confront these efforts:

- Defining the scope of responsibilities in a way that accurately applies across organizations and industries. Northeast Consulting Resources, Inc. (NCRI) has developed one such model that identifies 10 layers of functionality ranging from simply monitoring a wide-area network to supporting end-to-end networks all the way to the keyboard and shrink-wrapped applications sitting on the desktop.
- Defining appropriate cost and staffing levels associated with various responsibility sets and adjusted for the site size. NCRI's preliminary work shows that normalizing costs in terms of number of desktops supported is an approach that can be applied across many industries. By taking all staff costs, including benefits, and dividing them by the number of desktops supported, NCRI has begun to develop some staffing-cost and head-count guidelines.

> It is the staffing issue that causes many managers to lose sleep at night.
>
> ▲▲▲

For example, an organization with 1,000 users at a multibuilding site might expect to spend between $35 and $75 to support each desktop. At the low end of this cost scale, the staff might support all local-area network cabling, hubs, net protocols and applications such as electronic mail but rely on a separate organization to work with carriers and WAN equipment as well as systems administrators to support servers and desktop software. At the high end, the group might take on more WAN integration and desktop support.

By comparison, NCRI has seen cost ranges of $5 to $15 per desktop for providing remote support services to smaller, widely distributed offices. Here, the functions consist of network downloads, remote diagnostics, help desk support and site requirement definitions. Often, value-added resellers are used to supplement site personnel but usually at an additional cost.

Vendors such as Digital Equipment Corp., Hewlett-Packard Co., IBM, Lotus Development Corp., Microsoft Corp. and Sun Microsystems, Inc. should develop similar benchmarks for their distributed computing environments and share the information with the industry.

As distributed networks mature and replace mainframe-centric environments, chief financial officers will rightly ask for justifications for the millions of dollars spent annually to support the new environment. They will expect to see overall costs decrease or at least stay the same while services increase.

In our experience, poorly planned transitions often drive overall support head counts up, rather than down, as organizations scramble to run mainframe networks and distributed networks in parallel.

Planning effectively, benchmarking cost levels and selectively using value-added resellers and outsourcers can keep operational costs in check as the transition takes hold. Unless managers take a hard look at revamping support organizations and skills, they are unlikely to realize the productivity and cost-saving benefits of distributed computing and networks. ◪

Turner is a principal with Northeast Consulting Resources, Inc. She provides strategic and technical planning to end users and vendors in the areas of internetworking, global services and outsourcing.

HAVE YOU SURVIVED AN ALLIGATOR ATTACK? If you solved an unforeseen problem that plagued your network, write an article about it for our "Alligators in the Swamp" section.

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TELETOONS

BY FRANK AND TROISE

And then after we've figured out how to make their networks talk to each other without crashing, we'll start on the people!!
Bill Frank

LETTERS

Author defends article

In response to a recent letter ("Loopback tests," *NW*, Nov. 9) about my Alligator in the Swamp article ("Carrier circuit problem throws user net for a loop," *NW*, Sept. 28), I would like to substantiate my justification for certain statements in the article.

First of all, the basis for saying that 95% of circuit problems can be traced back to carriers comes from my own experience over the five years I have worked for The Toro Co. I have handled 180 circuit-related calls in that time and only replaced three pieces of on-premise equipment. The remainder were indeed problems in the carrier network. This calculates out to be less than 2%. Thus, the figure is closer to being 98% of the time that the problem was with the carrier network.

I also take offense to the term "haphazard" in reference to my troubleshooting approach. It was more of an oversight on my part when I took the carrier's word that the circuit looked clean and went on to diagnose my premise equipment. I should have been more forceful with the carrier to check for the loopback condition.

Finally, the comment about the "invalid frame" not justifying that I had a bad channel service unit (CSU) is not a logical conclusion. Bad or invalid frames can be the result of numerous problems in hardware or software. In this case, it happened to be a software protocol violation in IBM's Synchronous Data Link Control. It very well could have been caused by bad hardware in the CSU.

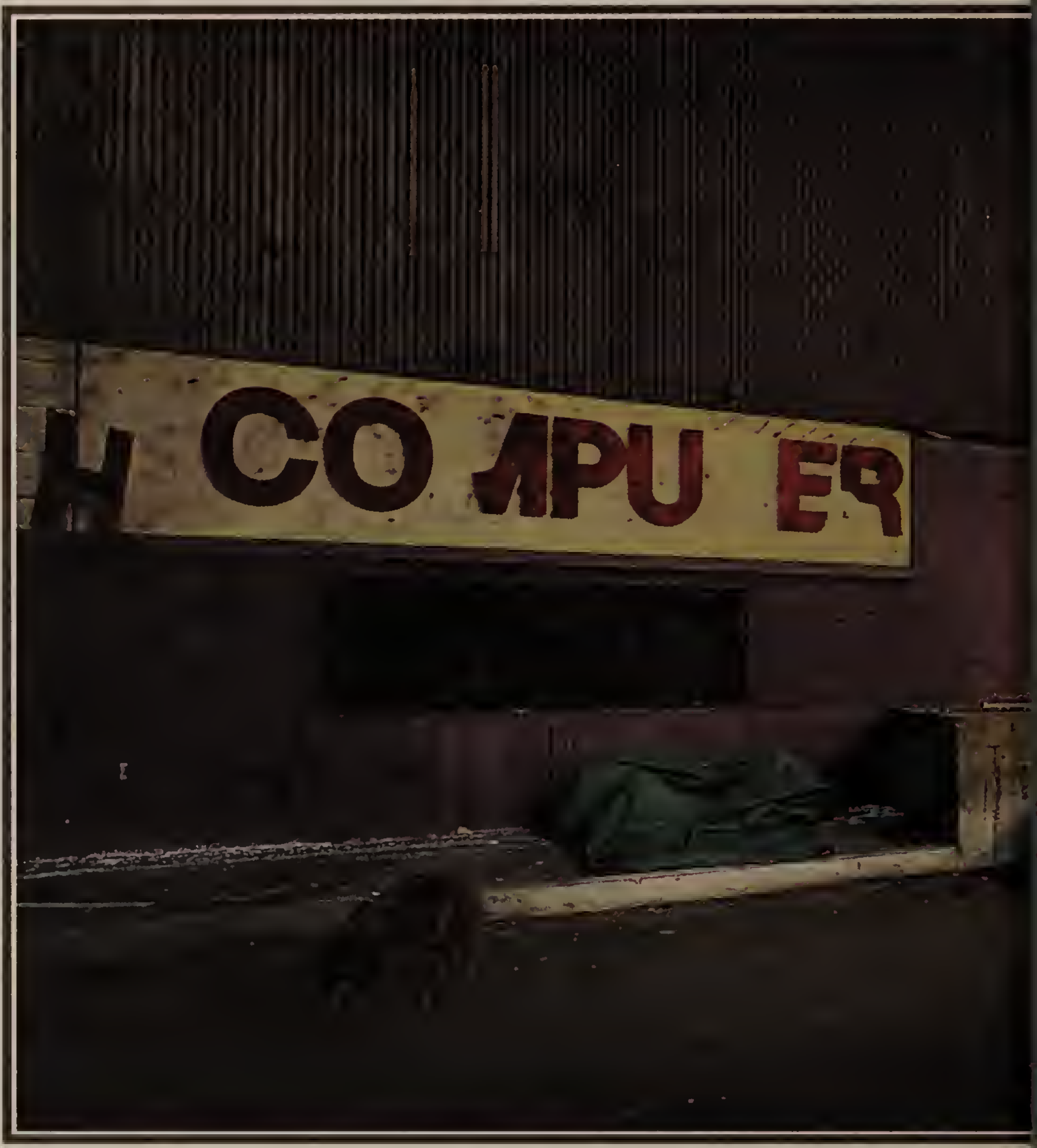
Overall, my troubleshooting technique was far from perfect. But it was adequate to resolve a very perplexing problem.

Darrell Anderson
Senior network analyst
The Toro Co.
Minneapolis

Want to respond to an article or opinion in Network World? *Mail typed letters to Editor,* Network World, *161 Worcester Road, Framingham, Mass. 01701, or fax them to (508) 820-3467. Transmit your response via MCI Mail at 390-4868 or to our Bulletin Board System. (See page 2 for BBS instructions.) Letters may be edited for space and clarity.*

OUR COMPUTERS TO OUTLAST MOST CO

Pick up a paper and you'll no doubt read about another PC company on the brink of collapse. Does it matter? Not much. Unless you're stuck with a computer that's out of commission from a company that's out of business.



In the 80's, it seemed every time you turned around a new computer company opened up. For a while it looked like all you needed was a soldering iron, a toll-free phone number and a P.O. Box to get started.

Those days are over. The market has matured. Customers are demanding more. And clone companies are faced with an ugly reality: the less you know about making computers, the less likely you're going to be successful at it.

Writers in the press and financial analysts on Wall Street are even compiling lists as to which are about to go under. While all of these involve an amount of speculation on the part of their authors, you may be surprised to learn that many of the larger clone companies appear on the majority of them.

It is not a question of whether it will happen. It is only a question of when.

All of which means that choosing the right computer company has

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With their current credit and cash flow problems, buying computers from financially vulnerable clone companies has become something of a gamble.

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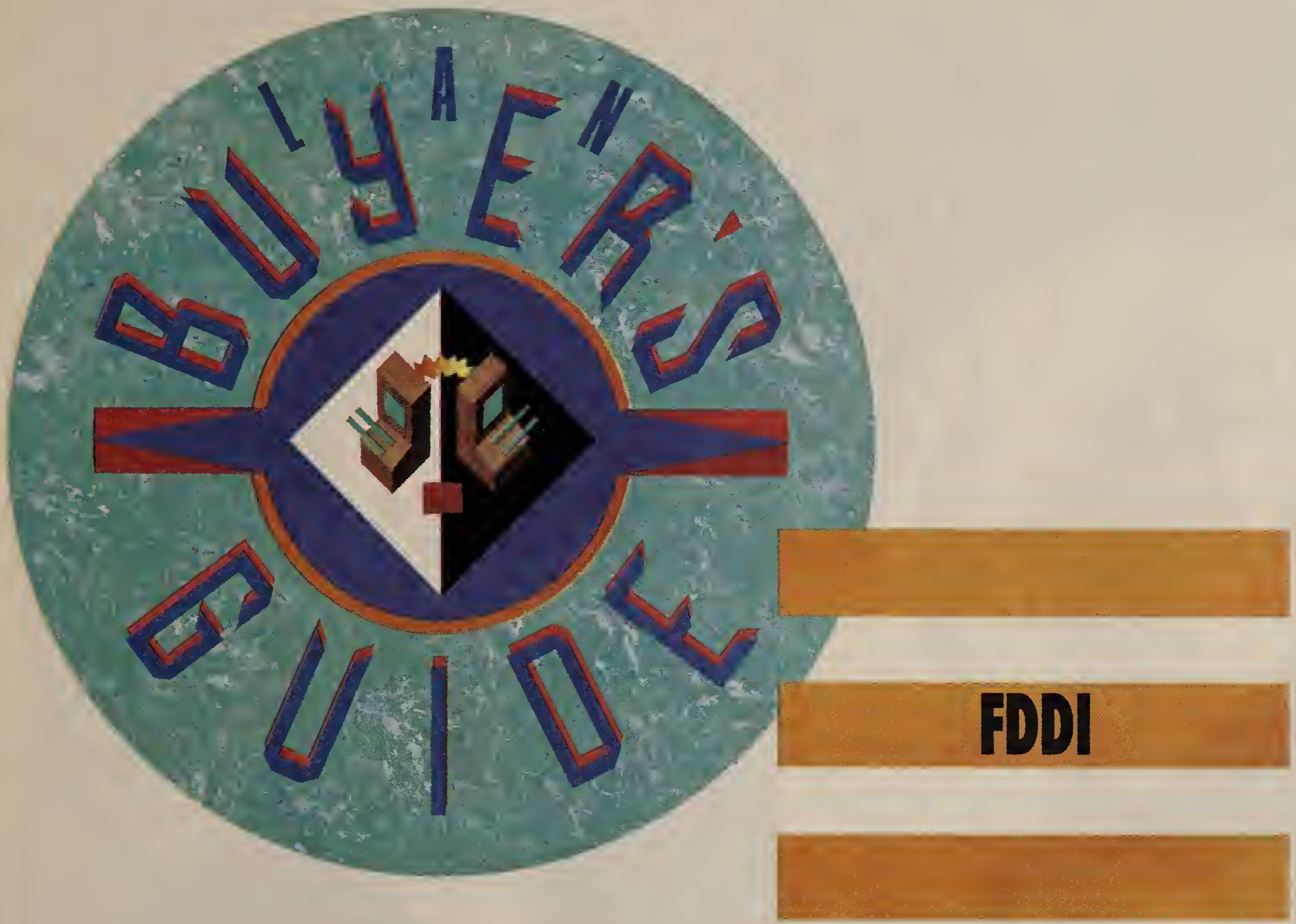

The fastest gun in the LAN world

Even with ATM and a faster Ethernet nipping at its heels, FDDI remains a good choice for high-speed networking.

By MIKE HURWICZ

In the cowboy movies, the wise old gunfighter warned the current fastest gun in the West, "You're good, son. But there'll always be someone coming after you." Nowadays, the old man could be talking about network technology.

Currently, Fiber Distributed Data Interface is the fastest gun in the local-area network market. At 100M bit/sec, FDDI easily shoots down token ring's top speed of 16M bit/sec and Ethernet's 10M bit/sec.

But there are a few emerging technologies such as a faster Ethernet and Asynchronous Transfer Mode (ATM) that are gunning for FDDI. At least one firm, Grand Junction Networks, Inc., is enhancing Ethernet to match FDDI's 100M bit/sec. This faster Ethernet may offer advantages over FDDI such as lower prices and better compatibility with existing Ethernet LANs.

ATM will initially run at 155M bit/sec and eventually move up to 622M bit/sec. It will also simplify network management by allowing companies to use the same technology on LANs and wide-area networks.

But it may take some time for these emerging technologies to mount a serious challenge to FDDI because they don't yet enjoy the firm standards or multivendor interoperability that FDDI does today. For instance, ATM's addressing scheme and mechanism for establishing and breaking connections haven't been finalized. And there's no standard at all for a faster Ethernet.

Meanwhile, the ANSI FDDI committee is preparing FDDI-2, which will enable FDDI to remain competitive with ATM by supporting transmission of digitized voice and full-motion video just as well as ATM does.

Furthermore, recent dramatic declines in FDDI prices are helping to keep the competitors at bay. The price drops are attributable in part to a maturing technology and success in implementing FDDI over copper, which eliminates the need for expensive optical interfaces.

But more established standards and better pricing won't last for long.

"Ultimately, ATM is more attractive," says Mike Earhart, Hewlett-Packard Co.'s product-line manager for link products. "It's still unclear how long FDDI will remain a viable technology. Performance and price, compared with other technologies, will largely determine FDDI's longevity" (see "A shootout in LAN town," page 57).

What's out there?

Users looking to build an FDDI network have a number of concentrators and adapters from which to choose. These components are expensive but can be a bargain for users looking for increased speed over existing Ethernet and token-ring LANs, fault tolerance and longer distances between nodes.

Concentrators come in a variety of models, including complex, expensive ones with multiple-slot chassis. Each slot supports multiport boards sporting several multimode or single-mode fiber cable interfaces. Some support interfaces for FDDI over unshielded twisted pair or shielded twisted pair.

These high-end concentrators may also support longer than normal cabling distances between nodes, multiple buses and a vendor-provided management application that supports the Simple Network Management Protocol.

Another feature sometimes found on sophisticated concentrators is multiple media access control (MAC) modules. MACs are primarily used to control access to the FDDI token-passing ring. If the entire FDDI network consists of a single concentrator, no MAC is required. Concentrators connected to an FDDI backbone need at least one MAC. Two MACs provide fault tolerance since either can keep the concentrator working if the other fails.

On the other end of the spectrum are plain vanilla concentrators that have no management application and support a fixed number of ports, a single MAC and shielded twisted-pair cabling only.

FDDI has a price advantage over emerging ATM products.
For example, Fore Systems, Inc. has priced an ATM adapter for Sun Microsystems, Inc.'s SBus at $3,995. FDDI SBus adapters generally run about $1,300 to $2,500. Fore Systems' ATM switch costs $6,800 per port, while high-end FDDI concentrators cost more than $3,000 per port.

There are multimedia hubs on the market that support FDDI, token-ring, Ethernet and other types of LANs. However, this Buyer's Guide focuses on equipment used to build FDDI-only nets.

There is a similarly wide range of

(continued on page 53)

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FDDI adapters

Company	Product	Type	I/O	RAM buffer (byte)	System bus						Drivers														Media	Management	Standard (See bottom of chart for key)	Base price
		D = DAS S = SAS	B = Burst mode D = Direct memory access P = Programmed I/O		EISA	ISA	MCA	Other	SBus	VME	NetWare	ODI	VINES	LAN Manager	NDIS	OS/2 LAN Server	NETBIOS	LAN support	AS/400 PC support	AIX	PC Network File System	Solaris	Sun OS	Other (See bottom of chart for key)	M = Multimode fiber S = Shielded twisted pair SM = Single-mode fiber U = Unshielded twisted pair	M = FDDI MIB P = Proprietary S = SNMP ST = Station Management		
ALFA, Inc. (508) 420-4300	A1200 SBus/FDDI Adaptor	S	D	128K					✔														✔		M	ST	C, D	$1,795
	A1201 SBus/FDDI Adaptor	S	D	128K					✔														✔		S	ST	A, B	$1,295
	A1300 SBus/FDDI Adaptor	S	D	512K					✔														✔		M	ST	C, D	$2,495
	A1301 SBus/FDDI Adaptor	S	D	512K					✔														✔		S	ST	A, B	$1,995
	A1000 ISA Bus FDDI Adaptor	S	D	128K		✔					✔	✔		✔	✔			✔						A	M	ST	C, D	$1,495
	A1001 ISA Bus FDDI Adaptor	S	D	128K		✔					✔	✔		✔	✔			✔						A	S	ST	A, B	$995
	A1100 EISA Bus FDDI Adaptor	S	D	128K	✔						✔	✔		✔	✔			✔						A	M	ST	C, D	$1,495
	A1101 EISA Bus FDDI Adaptor	S	D	128K	✔						✔	✔		✔	✔			✔						A	S	ST	A, B	$995
Crescendo Communications, Inc. (408) 732-4400	CDDI EISA Adapter	D,S	B, D	128K	✔																				M	M, P, S, ST	C	$995
	FDDI EISA Adapter	D, S	B, D	128K	✔						✔	✔	✔	✔		✔					✔			B, C, O	M	M, P, S, ST	C	$2,395
	CDDI SBus Adapter	S	B, D	128K					✔													✔	✔		S, U	M, P, S, ST	E	$1,495
	FDDI SBus Adapter	S	B, D	128K					✔													✔	✔		M	M, P, S, ST	C	$2,395
	CDDI MCA Adapter	D, S	B, D	128K			✔													✔					S, U	M, P, S, ST	E	$1,495
	FDDI MCA Adapter	D, S	B, D	128K			✔													✔					M	M, P, S, ST	C	$2,895
Digital Equipment Corp. (800) 332-4636, (508) 493-7161	DEC FDDIcontroller/EISA (SAS)	S	B, D	1M	✔						✔	✔		✔	✔									D, E	M	M, P, ST	C	$2,156
	DEC FDDIcontroller/EISA (DAS)	D	B, D	1M	✔						✔	✔		✔	✔									D, E	M	M, P, ST	C	$3,506
	DEC FDDIcontroller 700	S	D, P	1M				✔																F, G, H, I	M	M, P, ST	C	$2,250
	DEC FDDIcontroller 700-C	S	D, P	1M				✔																F, G, H, I	S	M, P, ST	A, C	$1,665
	DEC FDDIcontroller 400	S	D, P	1M				✔																H, I	M	P, ST	C	$16,915
Formation, Inc. (800) 257-0452, (609) 234-8745	FiberNet1001 FDDI Adapter	D	D	256K						✔													✔	P	M	ST	C	$7,995
Hewlett-Packard Co. (800) 637-7740, (415) 857-1510	J2157A HP FDDI for the 9000 series 800 Business Server	S	D	128K				✔																B	M	M, S, ST	C, D	$5,495
	J2156A HP FDDI for the 9000 series 700 workstation	S	D	128K	✔																			B	M	M, S, ST	C, D	$5,495
IBM Network Systems (800) 426-3333	Fiber Base Adapter/A	D, S	B, D	256K			✔				✔	✔		✔	✔	✔	✔	✔		✔					M	ST	B, C	$3,995
	Copper Base Adapter/A	D, S	B, D	256K			✔				✔	✔		✔	✔	✔	✔	✔		✔					S	ST	B, C	$3,495
Interphase Corp. (214) 919-9000	V/FDDI Peregrine 5211-II (STP)	S	D	4M						✔														J	S	ST	B, C	$4,195
	V/FDDI Peregrine 5211-II	S	D	4M						✔														J	M	ST	B, C	$4,695
	V/FDDI Peregrine 5211-II	D	D	4M						✔														J	M	ST	B, C	$5,995
	V/FDDI 4211 Peregrine (STP)	S	D	1M						✔														J	S	ST	B, C	$6,495
	V/FDDI 4211 Peregrine (fiber SAS)	S	D	1M						✔														J	M	ST	B, C	$6,995
	V/FDDI 4211 Peregrine (fiber DAS)	D	D	1M						✔														J	M	ST	B, C	$8,795
	S/FDDI 4611 SunBird (STP)	S	D	8K					✔														✔		S	M, S, ST	A, B	$1,295
	S/FDDI 4611 SunBird (fiber)	S	D	8K					✔														✔		M	M, S, ST	C	$1,795
	E/FDDI 3811 SeaGull (STP)	S	D	128K	✔						✔	✔		✔	✔	✔						✔		B, E, K	S	M, S, ST	A, B	$995
	E/FDDI 3811 SeaGull (fiber)	S	D	128K	✔						✔	✔		✔	✔	✔						✔		B, E, K	M	M, S, ST	C	$1,495
	E/FDDI 4811 SeaHawk (STP)	S	D	128K	✔						✔	✔		✔	✔	✔						✔		B, E, K	S	M, S, ST	A, B	$1,295
	E/FDDI 4811 SeaHawk (fiber)	S	D	128K	✔						✔	✔		✔	✔	✔						✔		B, E, K	M	M, S, ST	C	$1,795
NCR Corp. (908) 576-7500	StarLAN 100 NAU/MCA (MCA FDDI adapter)	D	B, D, P	128K			✔				✔	✔		✔	✔									L	M, SM	M, P, ST	C	$6,500
	StarLAN 100 NAU/EISA (EISA FDDI adapter)	D	B, D, P	128K	✔						✔	✔		✔	✔									L	M, S	M, P, ST	C	$6,250
Network Peripherals, Inc. (408) 321-7300	NP-SB/S	S	D	0					✔											✔			✔		M, S	S	A, B, C	$1,995
	NP-SB/D	D	D	0					✔											✔			✔		S	S	C	$2,995
	NP-EISA/S	S	B, D	128K	✔						✔	✔		✔	✔					✔					M, S	S	A, B, C	$1,995
	NP-EISA/D	D	B, D	128K	✔						✔	✔		✔	✔					✔					S	S	C	$3,295
	NP-AT/S	S	P	128K				✔			✔	✔		✔	✔					✔					M, S	S	A, B, C	$1,995
	NP-AT/D	D	P	128K				✔			✔	✔		✔	✔					✔					S	S	C	$3,295
	NP-VME/S	S	B, D	128K						✔										✔					M, S	S	A, B, C	$2,795- $3,295
	NP-VME/D	D	B, D	128K						✔										✔					S	S	C	$4,495
	NP-MCA/S	S	B, D	128K			✔				✔	✔		✔	✔					✔					M, S	S	A, B, C	$1,995
	NP-MCA/D	D	B, D	128K			✔				✔	✔		✔	✔					✔					S	S	C	$3,295
Optical Data Systems, Inc. (214) 234-6400	1070-S	S	D	0					✔		✔			✔	✔						✔		✔		S	ST	A	$1,995
	1071-S	S		0					✔		✔			✔	✔						✔		✔		M	ST	C, D	$2,495
	1072-EISA-S	S		0	✔						✔			✔	✔						✔		✔		S	ST	A	$3,995
	1072-AT-S	S	D	0		✔					✔			✔	✔						✔		✔		S	ST	A	$2,995
	1073-AT-S	D, S	D	0		✔					✔			✔	✔						✔		✔		M	ST	C, D	$2,995
	1073-AT-D	D	D	0		✔					✔			✔	✔						✔		✔		M	ST	C, D	$5,495
	1073-EISA-S	D, S	B, D	0	✔						✔			✔	✔						✔		✔		M	ST	C, D	$3,995
	1073-EISA-D	D	B, D	0	✔						✔			✔	✔						✔				M	ST	C, D	$5,995
	1074-S	S	D	128K						✔	✔			✔	✔								✔		S	ST	A	$2,795
	1075-S	S	D	0						✔	✔			✔	✔								✔		M	ST	C, D	$1,995
	1075-D	D	D	128K						✔	✔			✔	✔								✔		M	ST	C, D	$4,495

FDDI adapters

Company	Product	Type	I/O	RAM buffer (byte)	System bus						Drivers														Media	Management	Standard (See bottom of chart for key)	Base price
		D = DAS S = SAS	B = Burst mode D = Direct memory access P = Programmed I/O		EISA	ISA	MCA	Other	SBus	VME	NetWare	ODI	VINES	LAN Manager	NDIS	OS/2 LAN Server	NETBIOS	LAN support	AS/400 PC support	AIX	PC Network File System	Solaris	Sun OS	Other (See bottom of chart for key)	M = Multimode fiber S = Shielded twisted pair SM = Single-mode fiber U = Unshielded twisted pair	M = FDDI MIB P = Proprietary S = SNMP ST = Station Management		
PureData, Inc. (214) 242-2040	PDIFDDI-16	S	D	128K		✔					✔	✔												M	M		A, C	$2,199
	PDICDDI-16S	S	D	128K		✔					✔	✔												M			E	$1,549
	CMC-1156	D	B, D	256K						✔												✔	✔		M	M, ST	C	$7,795
	CMC-950	S	B, D	128K					✔														✔		M	M, ST	C	$2,995
Rockwell Int'l/CMC Network Products (805) 968-4262	CMC-950	S	B	128K					✔														✔		M	M, ST	C	$2,995
	CMC-1156	D	B	256K						✔												✔	✔		M	M, ST	C	$7,795
SBE, Inc. (800) 925-2666, (510) 680-7722	VCOM-100	S	D	4M						✔													✔	J, P	M	ST	C	$3,350
Sumitomo Electric U.S.A., Inc. (408) 737-8517	Suminet-3500 Network Service Board-VMEbus	D, S	D	128K						✔													✔		M, S	M, ST	B, C	$5,600
SunConnect (415) 336-5945, (415) 336-3214	SunLink FDDI/S	S	B, D	128K					✔		✔										✔			N	M, SM	P, ST	C	$2,995
SysKonnect, Inc. (800) 752-3334, (408) 725-4650	SK-5141	S	B, D	128K		✔					✔	✔	✔	✔	✔	✔		✔	✔		✔			O	M	M, P, S, ST	C	$1,995
	SK-5142	D	B, D	128K		✔					✔	✔	✔	✔	✔	✔		✔	✔		✔			O	M	M, P, S, ST	C	$3,495
	SK-5151	S	B, D	128K		✔					✔	✔	✔	✔	✔	✔		✔	✔		✔			O	M	M, P, S, ST	C	$1,595
	SK-5161	S	B, D	128K		✔					✔	✔	✔	✔	✔	✔		✔	✔		✔			O	M	M, P, S, ST	C	$1,595
	SK-5361	S	B, D	128K	✔						✔	✔	✔	✔	✔	✔		✔	✔		✔			O	S	M, P, S, ST	B	$1,895
	SK-5341	S	B, D	128K	✔						✔	✔	✔	✔	✔	✔		✔	✔		✔			O	M	M, P, S, ST	C	$2,395
	SK-5342	D	B, D	128K	✔						✔	✔	✔	✔	✔	✔		✔	✔		✔			O	M	M, P, S, ST	C	$3,895
	SK-5351	S	B, D	128K	✔						✔	✔	✔	✔	✔	✔		✔	✔		✔			O	S	M, P, S, ST	A	$1,895
3Com Corp. (800) 638-3266, (408) 764-5000	FDDILink-STP	S	B, D	128K	✔						✔	✔		✔	✔										S	M, ST	A, B	$1,295
	FDDILink-F	S	B, D	128K	✔						✔	✔		✔	✔										M	M, ST	C	$1,895
Ungermann-Bass, Inc. (800) 777-4526, (408) 496-0111	FDDI ISA	D, S	P	128K		✔					✔	✔		✔	✔		✔								M	M, ST	C	$3,495
	FDDI S-Bus	S	B, D, P	0					✔												✔				M	M, ST	C	$2,495
	FDDI EISA	D, S	B, D	128K	✔						✔	✔		✔	✔		✔								M	M, ST	C	$3,995

DAS = Dual-attach station
EISA = Extended Industry Standard Architecture
ISA = Industry Standard Architecture
MCA = Micro Channel Architecture
MIB = Management Information Base
NDIS = Network Driver Interface Specification
ODI = Novell, Inc.'s Open Data Link Interface
SAS = Single-attach station
STP = Shielded twisted pair
UTP = Unshielded twisted pair

(Key for other drivers)
A = Clarkson College of Technology'sUniversal Packet Driver
B = Hewlett Packard Co.'s HP-UX
C = Microsoft Corp.'s Microsoft Windows NT
D = Digital Equipment Corp.'s Pathworks
E = The Santa Cruz Operation, Inc.'s SCO Unix
F = DEC's Ultrix
G = DEC's OSF/1 AXP
H = DEC's OpenVMS
I = DEC's OpenVMS Alpha AXP
J = Unix
K = Univel's UnixWare
L = NCR Corp.'s Unix V.4
M = Novell, Inc.'s LAN WorkPlace
N = Sun Microsystems, Inc.'s SunLink SNA 3270
O = IBM's AIX
P = Wind River Systems, Inc.'s VxWorks

(Key for standards)
A = Green Book (AMD Co., Chipcom Corp., SynOptics Communications, Inc., others) FDDI over STP
B = SDDI (IBM, others) FDDI over STP
C = ANSI FDDI
D = FDDI-II (intended support)
E = Emerging ANSI FDDI over UTP

SOURCE: MIKE HURWICZ, EASTSOUND, WASH.

(continued from page 49)

FDDI adapter cards for workstations. High-end cards typically support a dual-attach station (DAS) feature, which can be used in one of two ways.

DAS can connect a workstation directly to an FDDI backbone, which consists of two counterrotating 100M bit/sec rings.

Under normal conditions, data is only transmitted over one ring at a time. If there is a break in FDDI's primary ring, a second ring is used to bridge the break and maintain a continuous loop.

DAS can also be used to connect a workstation to two different concentrators, a configuration known as dual homing. With dual homing, either concentrator can fail without isolating the workstation from the network.

High-end adapters also typically include an on-board processor, 512K bytes or more of random-access memory for packet buffering and support for fiber-optic media as opposed to copper. They are designed to work with high-performance workstation buses such as Extended Industry Standard Architecture (EISA) or Micro Channel Architecture (MCA).

Low-end adapters commonly have a single-attach station (SAS) feature, which limits their use to connecting workstations to concentrators. These adapters lack an on-board processor, typically have 128K bytes or less of on-board RAM for packet buffering, support copper media only and are designed for lower performance workstation buses such as the ISA bus.

Configuration options

The type of concentrator and adapter a user buys will depend upon which of three commonly used FDDI network configurations is being put in place.

The first configuration calls for concentrators to be cascaded together to form an FDDI backbone. Each backbone concentrator can support other concentrators, which in turn support directly attached workstations. The concentrators supporting workstations can be dual-homed to backbone concentrators for increased reliability.

A second configuration option uses concentrators on the backbone only. Workstations with SAS adapters connect directly to the concentrators. DAS adapters could be used to link workstations to two different concentrators, which is another form of dual homing.

Both of these configurations can use copper or fiber media. Typically, fiber would be used to support the longer distances of the backbone and copper for the shorter distances from workstations to concentrators. Cascaded concentrators can be connected via copper or fiber, depending on how far apart they are.

Users choosing to go with copper cable are likely to pick either unshielded or shielded twisted pair. They are then faced with yet another decision: which standard to follow.

There are two standards for shielded twisted pair. Most observers believe Shielded Distributed Data Interface (SDDI), developed by IBM, is becoming dominant over the Green Book standard, developed by Advanced Micro Devices, Inc. (AMD), Chipcom Corp., SynOptics Communications, Inc. and others. ANSI is also working on a standard, Twisted Pair-Physical Medium Dependent (TP-PMD), which will work for both unshielded and shielded twisted pair, but it's still in its early stages.

Lastly, customers can choose to use adapter cards only. This configuration requires more expensive DAS adapters. It can save customers money, however, by eliminating the need for hubs and concentrators.

The big drawback is that all devices are now directly on the ring. If any two of these devices fail, the ring will be segmented.

Compare this to the other configurations, in which only a few concentrators are critical to ring operation and any number of devices can fail without threatening the backbone ring. Using adapter cards only is a particular problem since computers with adapter cards are likely to be significantly less reliable than concentrators.

"Most everybody today uses hubs or concentrators," says

(continued on page 56)

Patrick B. Stewart
Manager–Distributed Processing
Management Information Systems
Weirton Steel Corporation

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FDDI concentrators

Company	Product	Chassis	No. slots	Max. no. ports	Max. ports per medium				Optical signal	Data bus/Band width		Standards					Management options			Management console						Price
		F = Fixed M = Modular			Multimode	Single mode	UTP	STP	A = Multimode laser B = Multimode LED C = Single-mode laser D = Single-mode LED	No.	Bandwidth per bus (M bit/sec)	Green Book	SDDI	LCF-PMD	TP-PMD	FDDI-2	Station Management	SNMP extensions	Front panel	Graphical user interface	Platform (see bottom of chart for key)	SNMP extensions	FDDI MIB	Standard	Optional/Price	
ALFA, Inc. (508) 420-4300	A2000 8-port concentrator	F	0	8	8		8	8	B	1	500	✓	✓	✓	✓		✓						✓			$4,500-$7,500
Ascom Timeplex, Inc. (800) 755-8556, (201) 391-1111	Time/LAN FDDI Concentrator*32	F	0	34	34	34			B, C	1	100							✓	✓	✓	E	✓	✓		$10,000	$18,000 - $70,000
Crescendo Communications, Inc. (408) 732-4400	CDDI Workgroup Concentrator	F	0	10			10	10	C	3	300				✓		✓	✓	✓	✓	A, B, G	✓	✓		$895	$7,995
	FDDI Workgroup Concentrator	F	0	10	2	2			B, C	3	300						✓	✓	✓	✓	A, B, G	✓	✓		$895	$12,995
Digital Equipment Corp. (800) 332-4636, (508) 493-7161	DECconcentrator 500	M	3	18	12		(1)	18	B, C	1	100	✓					✓	✓	✓	✓	F	✓	✓		$3,000 - $15,000	$5,400 - $22,950
IBM Network Systems (800) 426-3333	8240 FDDI Concentrator	M	8	24	24			24	D	1	100		✓				✓	✓	✓	✓	H	✓	✓		$26,210	$17,540 - $50,340
Interphase Corp. (214) 919-9000	Fiber Hub 1600	M	12	22	22			22	B	1	100		✓										✓	✓		$14,000 - $24,000
NCR Corp. (908) 576-7500	StarLAN 100 Concentrator	M	5	16					B, C	1	100						✓	✓	✓		B	✓	✓			$15,000 - $40,000
Network Peripherals, Inc. (408) 321-7300	Modular FDDI Workgroup Concentrator	M	8	16	16			16	D	3	200	✓	✓				✓	✓	✓				✓			$3,995 - $15,965
Optical Data Systems, Inc. (214) 234-6400	1085-4/2M	F	0	4	4	4	4	4	A, B, C, D	2	200	✓	✓			✓	✓	✓	✓	✓	A, B, G, H	✓	✓		$2,475 - $19,800	$8,700-$14,700
	1085-6/4M	F	0	6	6	6	6	6	A, B, C, D	2	200	✓	✓			✓	✓	✓	✓	✓	A, B, G, H	✓	✓		$2,475 - $19,800	$12,100-$19,300
	1085-8/6M	F	0	8	8	8	8	8	A, B, C, D	2	200	✓	✓			✓	✓	✓	✓	✓	A, B, G, H	✓	✓		$2,475 - $19,800	$9,800 - $23,400
	1085-14/12M	F	0	14	14	14	14	14	A, B, C, D	2	200	✓	✓			✓	✓	✓	✓	✓	A, B, G, H	✓	✓		$2,475 - $19,800	$23,499 - $40,299
	1090	M	12	62	62	62	62	62	A, B, C, D	2	200	✓	✓			✓	✓	✓	✓	✓	A, B, G, H	✓	✓		$2,475 - $19,800	$28,730 - $111,890
	1091	M	7	32	32	32	32	32	A, B, C, D	2	200	✓	✓			✓	✓	✓	✓	✓	A, B, G, H	✓	✓		$2,475 - $19,800	$25,290 - $62,040
	1092	M	5	17	17	17	17	17	A, B, C, D	2	200	✓	✓			✓	✓	✓	✓	✓	A, B, G, H	✓	✓		$2,475 - $19,800	$23,160 - $41,640
PureData, Inc. (214) 242-2040	PDCCDDIA-8	F	0	8				8		1	100				✓											$729
Sumitomo Electric U.S.A., Inc. (408) 737-8517	Suminet-3500 FDDI Concentrator	M	6	12	12			12	B, D	1	800		✓				✓	✓	✓	✓	D	✓	✓	✓		$9,400 - $17,400
SynOptics Communications, Inc. (800) 776-6895, (408) 988-2400	LattisNet Model 2914 Fiber Optic FDDI Workgroup Concentrator	F	0	14	14				B	3	300						✓	✓		✓	B	✓	✓		$4,995	$23,995
	LattisNet Model 2912 STP FDDI Workgroup Concentrator (2)	F	0	14				14		3	300	✓					✓	✓		✓	B	✓	✓		$4,995	$15,500
	LattisNet Model 2912 A SDDI Workgroup Concentrator	F	0	14				14		3	300		✓				✓	✓		✓	B	✓	✓		$4,995	$15,500
SysKonnect, Inc. (800) 752-3334, (408) 725-4650	SK-FDDI Concentrator	M	12	12	12			12	B	1	100	✓	✓				✓	✓	✓		C	✓	✓			$9,995 - $18,995

LCF = Low Cost Fiber
MIB = Management Information Base
PMD = Physical Medium Dependent
TP = Twisted Pair

(Key for management platform)
A = Hewlett-Packard Co.'s OpenView for Unix
B = SunConnect's SunNet Manager
C = Network Managers Corp.'s NMC 3000/1000
D = Sumitomo Electric's Suminet Manager
E = Ascom Timeplex's Time/LAN 100 Element Management System
F = DEC's Polycenter family (DEC Management Control Center)
G = IBM's NetView/6000
H = Optical Data Systems, Inc.'s LanVision for Windows

FOOTNOTES:
1) Thin wire
2) SynOptics' shielded twisted-pair hub has 2 models. The 2912 supports Green Book FDDI, and the 2912A supports SDDI.

SOURCE: MIKE HURWICZ, EASTSOUND, WASH.

(continued from page 53)

Gordon Stitt, vice-president of marketing with Network Peripherals, Inc. "I'm sure there are some people using DAS adapters to directly connect to the backbone, but that's dropping off."

Others agree. "It might be reasonable to connect a small number of servers or workstations directly to the ring," says Noel Lindsay, product manager with Crescendo Communications, Inc. "But as you add devices, you get a higher probability of two failures segmenting the ring."

Making the choice

Once a buyer has determined which configuration and media will be used, vendor selection can begin.

For FDDI concentrators, modular equipment is easily expanded with the addition of new port boards, thus enabling users to buy the number of ports needed today and incur the cost of additional ports only when they are needed. With fixed-port concentrators, users must pay for all the ports in the chassis, whether they are used or not.

Optical Data Systems, Inc.'s (ODS) 1090 has the largest number of ports among the concentrators listed in the chart on this page. It has 12 slots, each of which supports a board with five ports for a total of 60 ports. The unit also includes two ports designed to connect to an FDDI backbone ring or workstations, bringing the total number of ports to 62.

On the other hand, if the user has just a few FDDI devices in each location and long distances between them, small fixed-port concentrators such as ALFA, Inc.'s eight-port A2000 or Crescendo's 10-port CDDI or FDDI Workgroup Concentrators will do the job. Fixed-port concentrators may also be less expensive.

Because of their simplicity, fixed-port units are generally just as reliable as modular concentrators. However, modular equipment makes replacement of failed parts easier and less disruptive to the FDDI ring.

With modular equipment, the concentrator can usually remain attached to the network while internal boards are changed. With fixed-port devices, the entire unit must be removed from the net when a failed part necessitates repair work, a process that can disrupt the network.

Modular concentrators have other benefits, including the ability to upgrade to multiple MACs, which can bring added reliability to an FDDI network. When a device attached to a concentrator with two MACs attempts to insert itself into the FDDI ring, the concentrator can use one MAC to fool the device into thinking it has completed the task.

In reality, the second — or roving — MAC is double-checking the quality of the link between the device and the concentrator.

If the roving MAC can't establish reliable communications between the device and the concentrator, it won't insert the device into the ring. If reliable communications can be established, on the other hand, a two-MAC concentrator can perform the insertion gracefully without bringing the ring down momentarily.

The FDDI protocol is designed to handle the momentary interruptions of inserting new devices, but graceful insertion eliminates even the few milliseconds of downtime caused by those interruptions. Even without a second MAC, link quality is checked during insertion. But the second MAC adds another round of checking.

Interphase Corp.'s Fiber Hub 1600 and Ascom Timeplex, Inc.'s Time/LAN FDDI Concentrator* 32 provide link testing and graceful insertion when configured with two MAC modules.

Two MACs don't automatically provide graceful insertion, though. Crescendo's CDDI and FDDI Workgroup Concentrators have two MACs that check link quality before insertion. However, graceful insertion will come in a future enhancement.

While modular concentrators might seem better suited to large or growing networks because of their size and expandability, users should by no means rule out fixed-port concentrators for such environments. Users with large, active, growing and critical LANs frequently use plain vanilla concentrators, which are inexpensive and generally very reliable.

Conversely, sophisticated modular concentrators may be appropriate for small LANs with limited growth potential. For instance, a small 12-node LAN may be implemented using a concentrator such as IBM Network Systems' 8240 FDDI Concentrator, a modular device supporting up to 24 ports. This leaves the user with 12 ports for expansion or possible dual homing.

Cable me

Now comes the issue of cabling. Some units support both copper and fiber, while others support one or the other.

Users opting for copper to the desktop save money while getting essentially the same performance. But the distance between the workstation and concentrator cannot exceed 100 meters, which all copper-based FDDI standards specify. Fiber, on the other hand, can go up to 2 km from concentrator to desktop with LED light sources or up to 40 km with more powerful laser light sources.

SDDI is the dominant copper cabling alternative in concentrators. Only Digital Equipment Corp. still exclusively supports the Green Book standard, while IBM, Interphase and Sumitomo Electric U.S.A., Inc. support only SDDI. Network Peripherals, ODS, SynOptics and SysKonnect, Inc. support both the Green Book and SDDI as options. Ascom Timeplex and NCR Corp. don't support twisted pair at all.

All vendors support the ANSI FDDI standard. Only ODS says it will offer FDDI-2 support. There is also a Low Cost Fiber-PMD standard, which is limited to 1 km from concentrator to device, as opposed to 2 km for standard FDDI. However, only ALFA is promising support for this emerging standard.

Users requiring greater distances than those typically supported by FDDI should consider testing concentrators from vendors that claim better than standard distances.

For instance, ODS concentrators support distances of 4 km using multimode fiber with an LED light source, instead of the usual 2 km. Using single-mode fiber and LEDs, they support cabling distances up to 6 km, rather than the typical 2 km.

ODS also stretches the distance for single-mode fiber with a laser light source — from 40 km to 46 km. However, the prize for distance stretching goes to NCR's StarLan 100 Concentrator, which NCR says can achieve distances of 60 km using a laser light source.

Note also that a vendor may support longer distances between two concentrators than between a concentrator and a device.

For instance, Crescendo provides laser interfaces with a 10-km limitation between concentrators but only LED interfaces to devices with a 2-km limit. Sumitomo supports 40 km between concentrators but only 2 km from concentrators to devices.

Distances specified are for an unbroken length of fiber-optic cable. Splices or other interruptions in the cable will lower achievable distances.

If several individual FDDI devices each pump a lot of data, multiple concentrator buses can reduce delays by allowing users to put devices on separate rings, where they won't compete with one another for bandwidth.

A dual-bus, 200M bit/sec internal bandwidth concentrator, such as any of the ODS concentrators, allows users to create two FDDI rings within a single concentrator or to attach devices on one concentrator to two different backbone rings.

Fixed-port concentrators can have multiple buses, too. SynOptics and Crescendo concentrators, with three buses and 300M bit/sec of internal bandwidth, allow the customer to create or connect to three FDDI rings with a single concentrator.

Beyond these basic configuration and bandwidth management considerations, price and network management will typically play a major part in the concentrator buying decision.

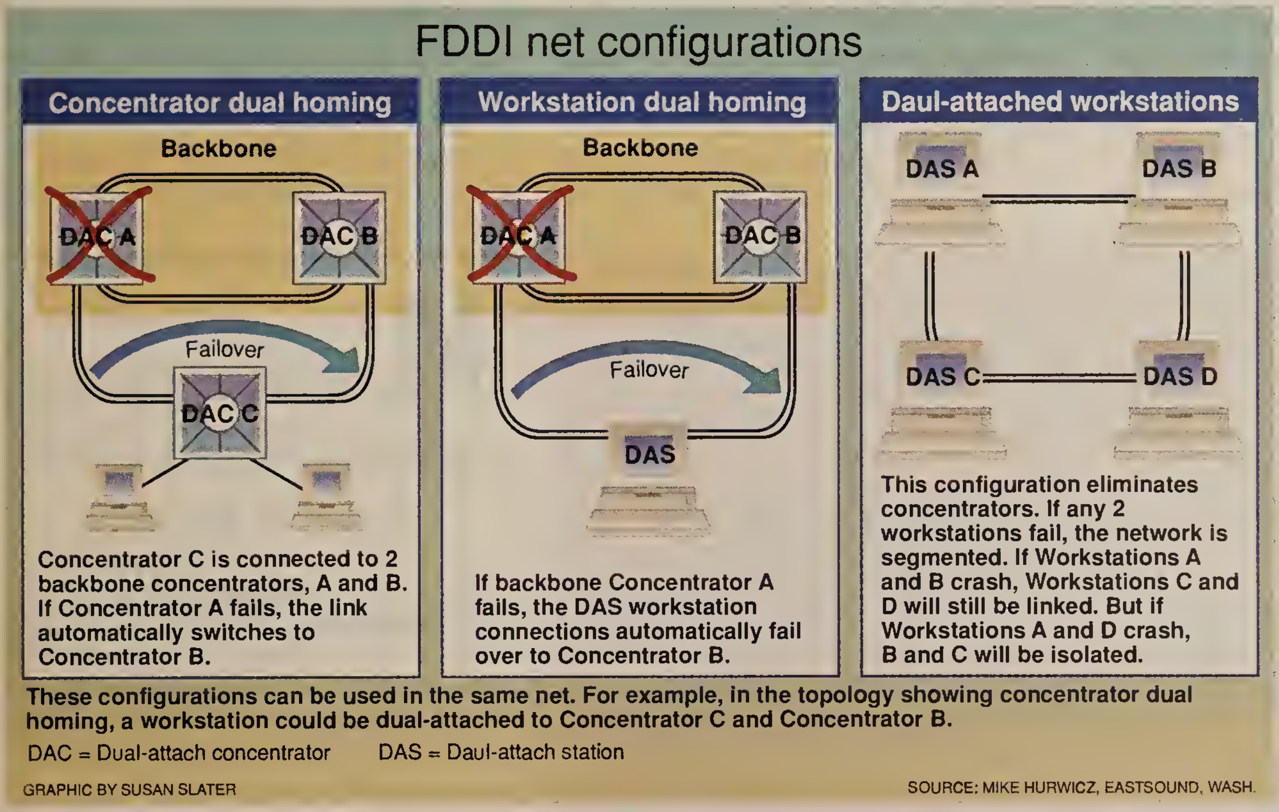
Most users will follow one of three strategies for managing concentrators.

Users could choose a vendor with a proprietary concentrator management application and use that application exclusively. With this approach, they will generally benefit from a powerful management tool tied specifically to that vendor's concentrator.

On the other hand, customers

(continued on page 58)

FDDI net configurations



Concentrator C is connected to 2 backbone concentrators, A and B. If Concentrator A fails, the link automatically switches to Concentrator B.

If backbone Concentrator A fails, the DAS workstation connections automatically fail over to Concentrator B.

This configuration eliminates concentrators. If any 2 workstations fail, the network is segmented. If Workstations A and B crash, Workstations C and D will still be linked. But if Workstations A and D crash, B and C will be isolated.

These configurations can be used in the same net. For example, in the topology showing concentrator dual homing, a workstation could be dual-attached to Concentrator C and Concentrator B.

DAC = Dual-attach concentrator DAS = Daul-attach station

GRAPHIC BY SUSAN SLATER

SOURCE: MIKE HURWICZ, EASTSOUND, WASH.

A shoot-out in LAN town

There's going to be a shoot-out on Main Street, and control over the local-area network world is at stake. The buzz around town is that those start-up gunslingers — Asynchronous Transfer Mode (ATM), packing 155M bit/sec, and 100M bit/sec Ethernet — will be stepping side-by-side with old-timers such as 10M bit/sec Ethernet and 4M/16M bit/sec token ring in aiming to rid the town of Fiber Distributed Data Interface.

But the 100M bit/sec FDDI doesn't have much to fret about right now. The new boys in town won't get off too many shots until they're standardized and can offer the same type of multivendor interoperability as FDDI. This leaves price and performance as ammunition that Ethernet and token ring can use in the battle.

Looking only at price, FDDI is among the most expensive standardized LAN technologies available today, with prices running between $1,000 and $8,000 per FDDI adapter. In contrast, market research firm Dataquest, Inc. estimates that an average 4M/16M bit/sec token-ring adapter sells for $410, while a 10M bit/sec Ethernet adapter costs only $170. As an established technology, FDDI will likely remain less expensive than either ATM or 100M bit/sec Ethernet for some time.

Taking into account performance as well as price, FDDI can be a better deal than token ring or Ethernet. For instance, FDDI may offer five times the performance for four times the price in comparison to those older technologies.

However, ATM holds the promise of outperforming FDDI and could overtake FDDI once ATM pricing is more in line with that of FDDI.

When ATM does become affordable, customers with small, simple FDDI networks will generally be able to make the quickest conversion to ATM nets.

Most of these users tap FDDI primarily as a backbone to connect Ethernet and token-ring LANs. This kind of deployment limits investment in the uncertain future of FDDI and creates a net topology that will be more readily upgradable to ATM.

This network strategy is supported primarily through the use of modular multimedia hubs, which are devices supporting interfaces to a variety of different networks. This strategy requires few, if any, FDDI adapter cards. The only adapters are for computers on the backbone, usually functioning as routers or file servers. If high-speed networking to the desktop is required, users may protect themselves by deploying copper-based FDDI.

With this network strategy, upgrading from FDDI to ATM will require changes in backbone hubs or concentrators only. An upgrade to ATM at the desktop will require replacing cheaper, older Ethernet and token-ring technology, rather than newer, more expensive FDDI equipment.

For users that never need ATM to the desktop, running FDDI over copper can be a permanent solution and much less costly than fiber-based FDDI. Users that want ATM to the desktop may have to install fiber cable in order to get ATM's higher speeds, but fiber may be cheaper or of better quality by that time. In addition, copper-based ATM solutions are likely to emerge but will probably operate at low speed, such as 55M bit/sec.

— Mike Hurwicz

(continued from page 57)

committed to a particular management platform, such as HP's OpenView or Sun Microsystems, Inc.'s SunNet Manager, can team with a concentrator vendor providing management applications that run on top of those platforms.

For instance, ODS has its own management application, ODS LANVision, which runs under Windows or on a number of management platforms, including OpenView, SunNet Manager and IBM's NetView/6000.

Finally, customers who want to be able to use concentrators from any vendor and still have integrated management can set up a generic Simple Network Management Protocol-based management console for concentrators. Nearly all concentrator vendors support SNMP.

In the pricing arena, a fully configured modular concentrator with fiber ports, such as the ODS 1090, can cost upwards of $100,000. On the other end of the scale, PureData, Inc.'s PDCCDDIA-8 costs just $729, while ALFA's fixed-port twisted-pair concentrator goes for $4,500.

Typical prices are currently about $1,000 per twisted-pair port and $2,000 per fiber port. These prices are expected to fall rapidly, however, particularly in the twisted-pair arena.

Hitting the boards

Selecting an FDDI adapter is perhaps easier than selecting a concentrator because there are fewer differentiators among products. Chief among those differentiators is the type of computer bus the adapter works with.

Most vendors supply adapters for just a few types of buses. For instance, 3Com Corp. only supplies EISA adapters, while IBM has MCA and PureData has ISA bus cards. NCR has MCA and EISA adapters, while SysKonnect has EISA and ISA.

Several vendors have FDDI adapters for personal computer and higher performance workstation buses. For instance, Sun's SPARCstation is a popular platform for FDDI adapters. ALFA, Crescendo, Interphase, Ungermann-Bass, Inc., ODS and Rockwell International/CMC Network Products support the SPARCstation's Sbus.

SunConnect, a division of Sun, supports only the Sbus. Interphase also supports VME and EISA, while Rockwell supports VME in addition to the Sbus. ODS, however, has an exceptionally broad product line, supporting EISA, ISA and VME buses in addition to Sbus.

> Most vendors supply adapters for just a few types of buses.
>
> ▲▲▲

Three vendors, Formation, Inc., SBE, Inc. and Sumitomo, have only VME products. DEC is the only vendor to support TurboChannel and its own XMI. Similarly, HP is the only vendor to support its NIO backplane.

Users also have to find adapters that support the preferred media. Vendor support of shielded and unshielded twisted pair varies. Crescendo has been a leader in developing and promoting TP-PMD. PureData is the only other company listed in the chart on page 52 to support the emerging TP-PMD standard.

However, six vendors support SDDI and the Green Book standards for shielded twisted pair. DEC and ODS support only the Green Book, while IBM and Sumitomo support only SDDI.

All adapter vendors support ANSI's FDDI standard, but only ALFA, HP and ODS say they will support FDDI-2. None of the adapter vendors have committed to supporting LCF-PMD.

Beyond the basic discriminators of bus and media standards, price and speed will typically be the major criteria for selecting adapter cards.

A number of factors help an adapter card transfer information more quickly to and from the computer bus and thus, in turn, help it exchange more information over the network. Adapter cards for higher performance buses, such as EISA and MCA, will naturally be able to transfer more information in the same time than those for lower performance buses, such as ISA.

Bus mastering and burst mode generally mean substantially enhanced speed, too. More packet buffering RAM should make a card faster. An on-board processor usually speeds things up, as well.

Unfortunately, vendor benchmarks are seldom comparable, and even less often are they truly indicative of real-life performance, which varies widely depending on the application.

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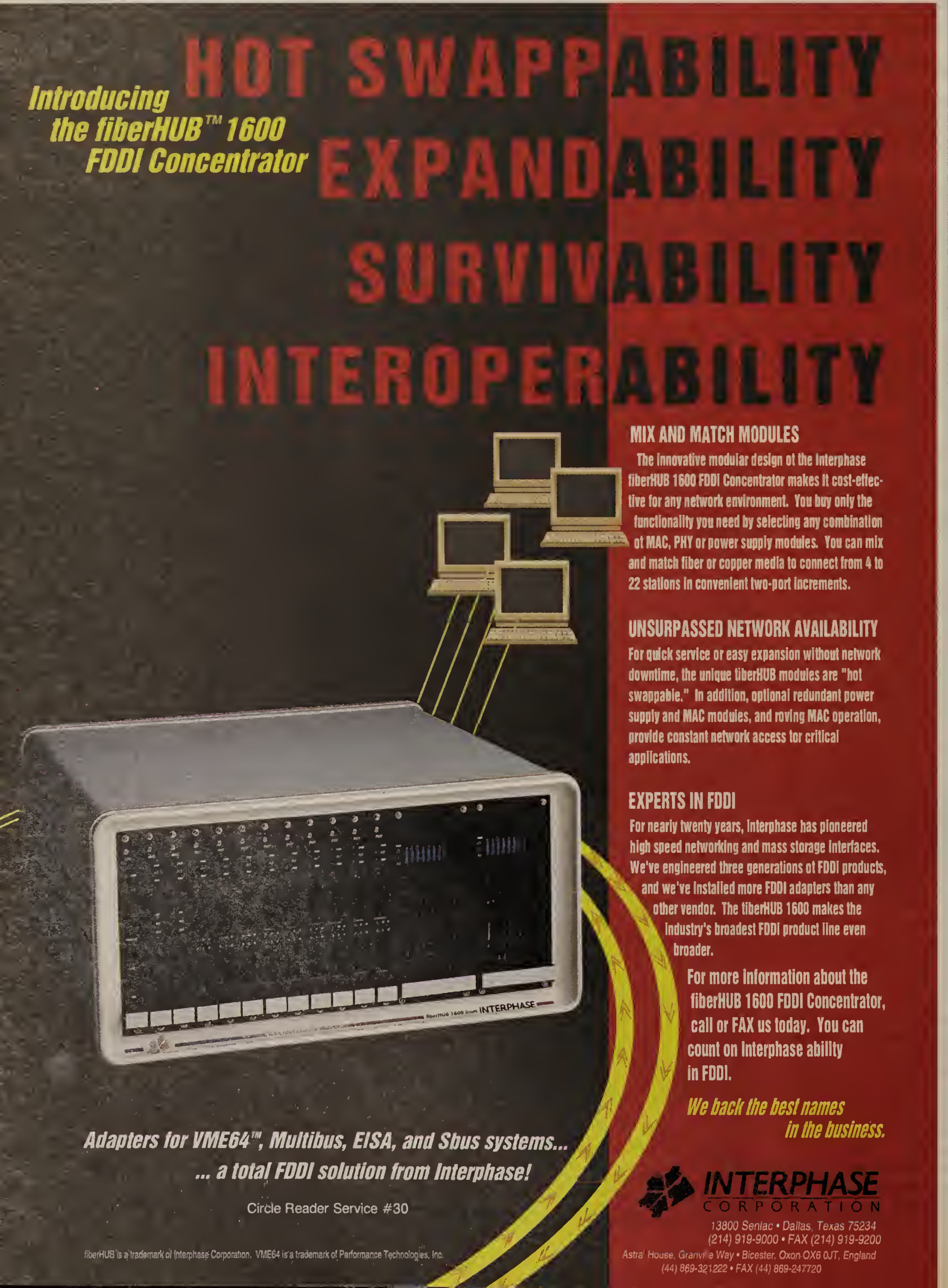

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any FDDI adapter will transfer data between the card and net at 10M bit/sec or more. If data transfer in excess of 10M bit/sec is required, the best policy is to do on-site testing using production applications.

As for pricing, FDDI adapters only recently fell below $1,000, with products such as ALFA's A1001 and A1101 and Interphase's E/FDDI 3811 SeaGull among the first to reach that mark. All three are shielded twisted-pair adapters for the ISA or EISA buses and sell for $995.

Generally, SAS shielded twisted-pair adapters for PCs are running about $1,000 to $2,000. Fiber approximately doubles the price. DAS adds another $1,000 or $2,000.

Adapters for less common buses are more expensive. For instance, the most expensive card in this chart, Sumitomo's DAS fiber-based Suminet-3500 Network Service Board-VMEbus, costs more than $8,000.

Working together

With concentrator and adapter vendors supporting a multitude of standards, interoperability among various vendors' equipment is an issue. The vendors realize this, and interoperability testing for FDDI is already well advanced.

AMD and other vendors have been testing FDDI interoperability at AMD's Advanced Networking Test Center since 1990. The University of New Hampshire also maintains an Interoperability Test Lab, where many FDDI vendors have done testing using public test suites under the supervision of industry experts. In addition, the INTEROP trade show has been featuring a multivendor FDDI network, called the FDDI Solutions Showcase, since 1989.

The result is that products based on ANSI FDDI are usually as solid from the point of view of interoperability as products based on older technologies such as token ring and Ethernet. Products conforming to de facto standards such as the Green Book and SDDI are almost sure to be interoperable, too, as long as they support the same de facto standard.

For customers who need high-speed solutions now, FDDI is the safest and least expensive choice. However, many customers may choose to limit their investment in FDDI to permit future growth and migration to newer technologies. Those who can may simply choose to wait.

"Our long-range plan is for a fiber backbone with token ring on each floor," says Tony Cheung, corporate MIS operations manager for Specialty Brands in San Francisco. "Currently, we have a copper backbone running Thomas-Conrad Corp.'s 100M bit/sec ARCnet protocol, but there are advantages to a more standards-based solution. Ultimately, we'll probably run either FDDI or ATM on the backbone. We're waiting to see whether ATM kills FDDI before it's really born."

Others are sitting on the same fence. Jamie Booth, computer operations and technical support manager for Hunton and Williams, a law firm based in Richmond, Va., manages a network of 1,600 nodes attached to 22 SynOptics hubs spread over eight sites. "We can afford to wait and see what happens between fast Ethernet, FDDI and ATM," he says.

Looking at mail-enabled apps

continued from page 41

ing Application Programming Interface and the X.400 API Association's common mail calls.

Dynamic Data Exchange (DDE) lets two Windows-based programs exchange information. Many E-mail packages allow DDE calls, so applications such as Excel or Lotus' Ami Pro, which support DDE in their scripting or macro languages, can be made to be mail-enabled without much difficulty.

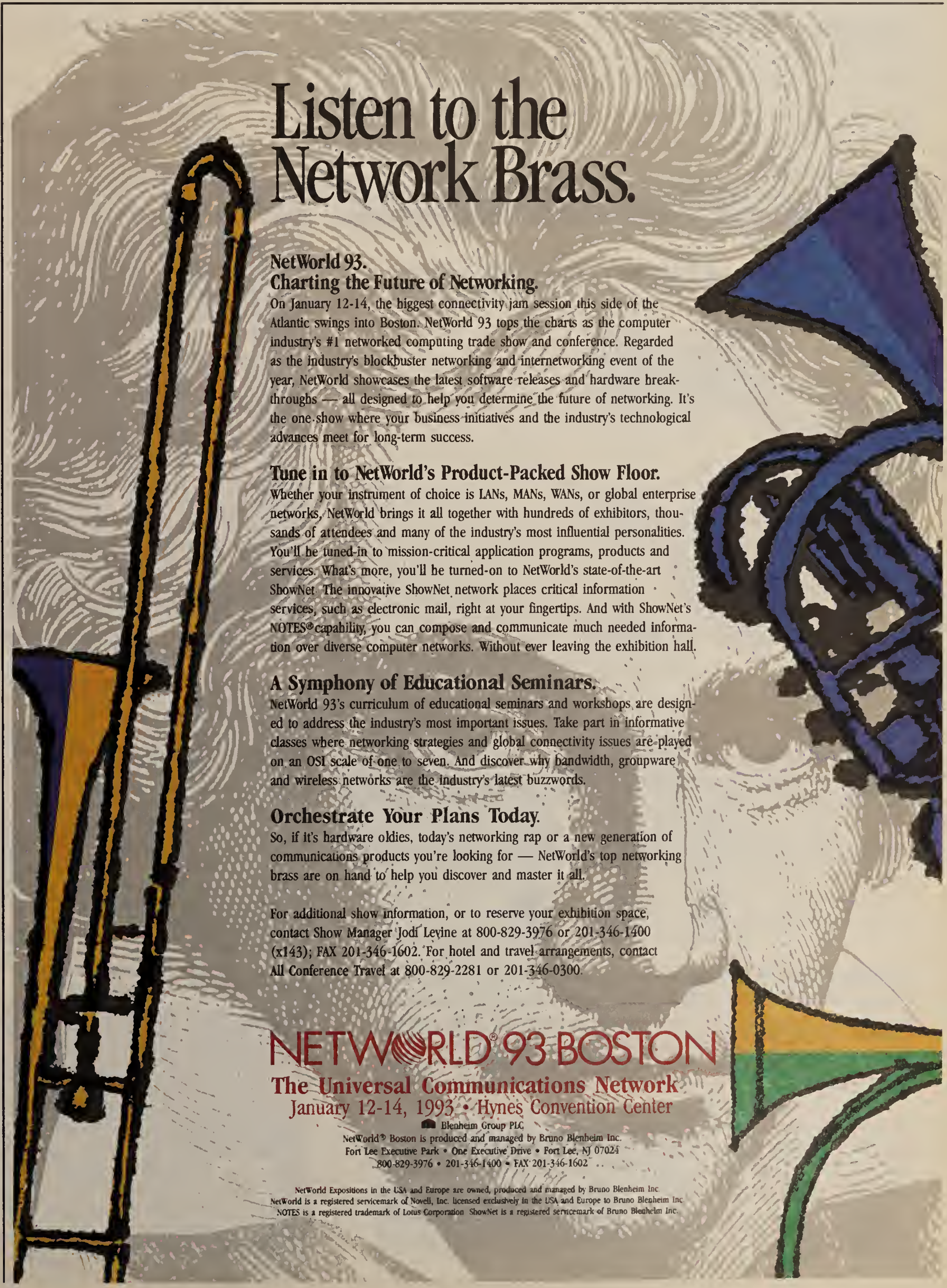
Forms routing and work flow packages let you design forms and their processing logic using a fourth generation-like environment. Examples of these are Beyond, Inc. BeyondMail in the personal computer arena and IBM's ECFORMS and Verimation, Inc.'s Memo/Forms in the mainframe world.

File format APIs are the most popular type of mail-enabling tool today, but they will gradually be supplanted by function-call APIs because the latter are more reliable and easier to use.

Despite all the publicity over "API wars," the real action will be with forms routing and work flow. That's because it is much easier to interpret a request or data represented as a standard form than it is to process something in free-form text.

Hence, users looking to build their mail-enabled applications would do well to start evaluating forms routing and work flow packages rather than APIs.

Ferris is president of Ferris Networks, a San Francisco consultancy.



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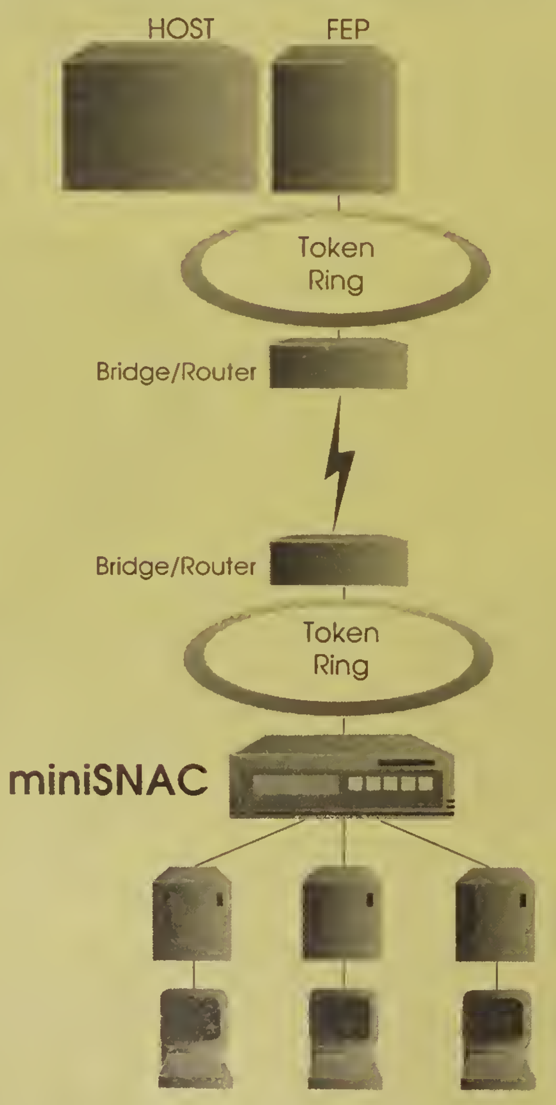

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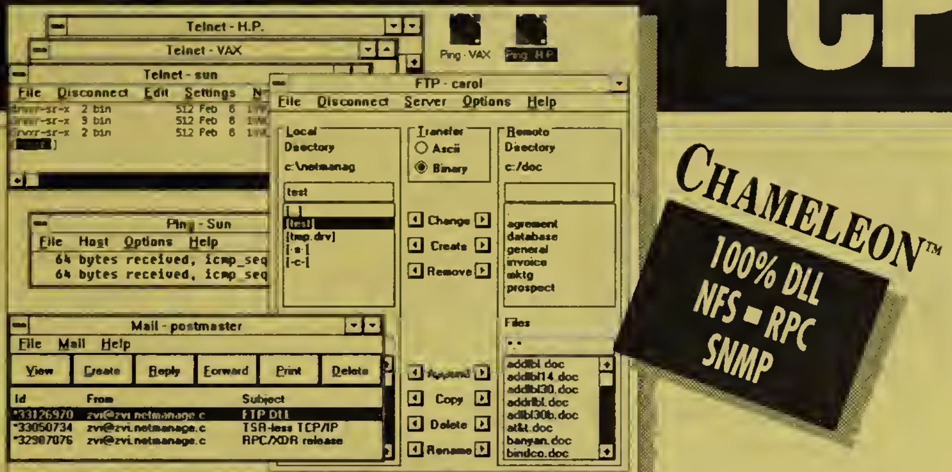
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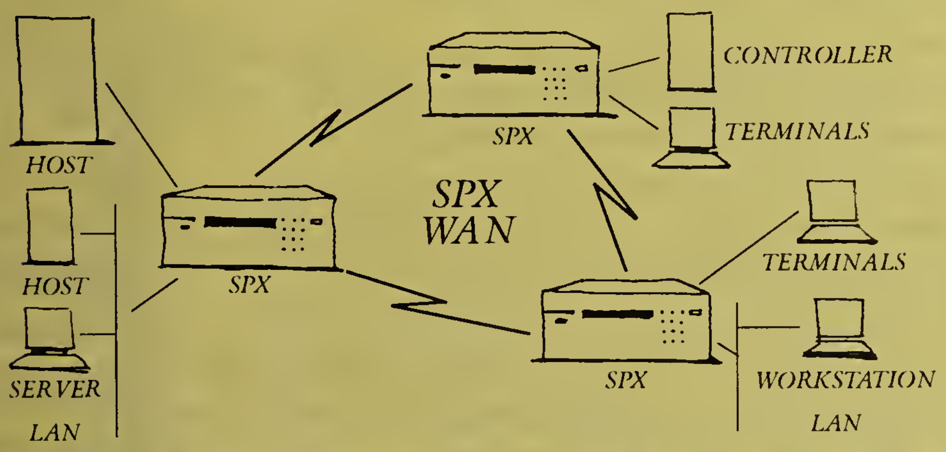

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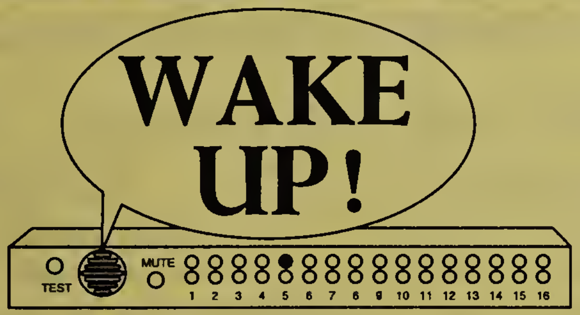

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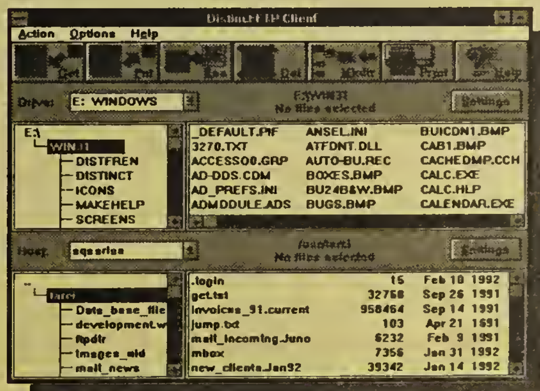

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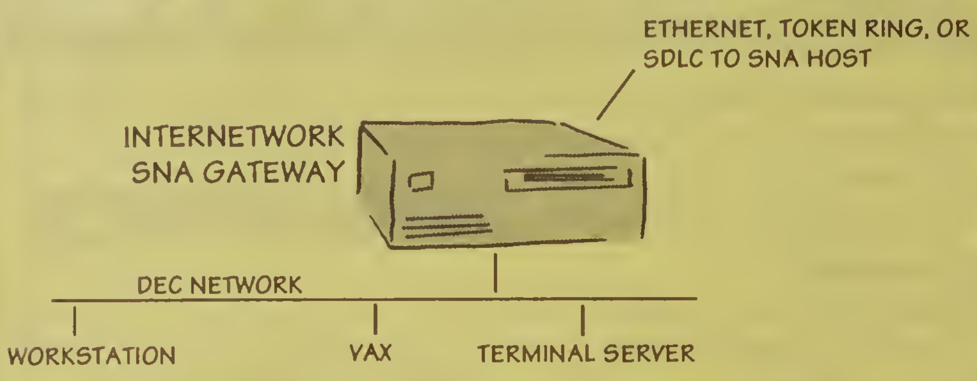

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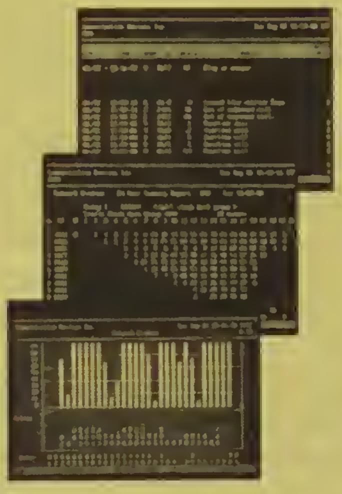

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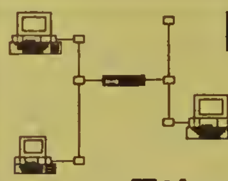

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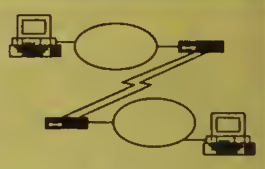

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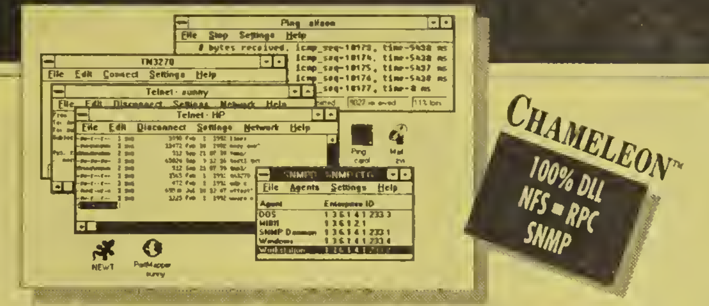

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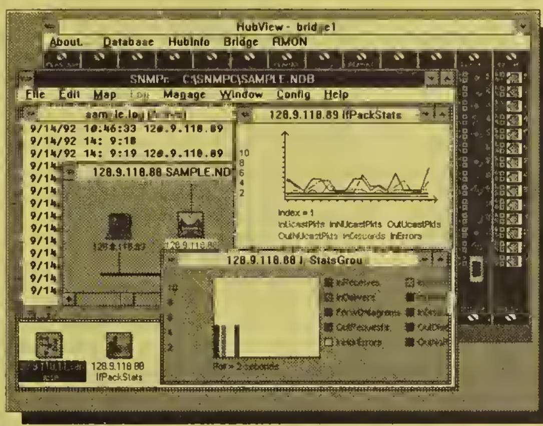

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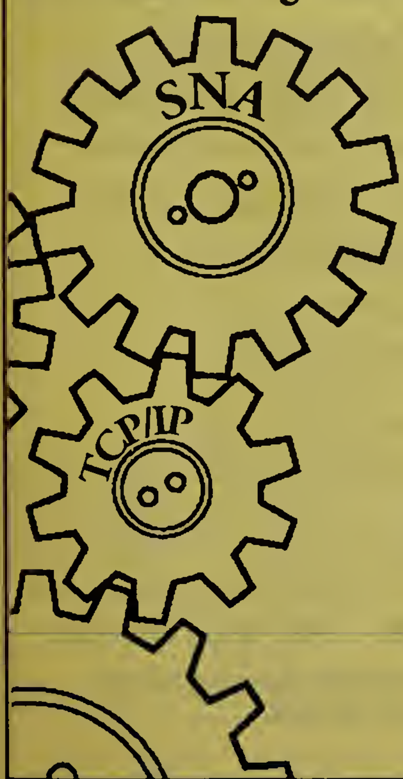

At Apertus, we recognize the growing demands you face to provide your TCP/IP-based users access to IBM mainframe resources. At the same time, we understand the expense, high CPU cycle requirements and administrative complexity of mainframe software solutions. That's why we've engineered the Datastar to give you a high performance, total system solution for accessing your IBM, SNA, and Bisync host resources from TCP/IP networks without the addition of expensive host software. Key features of the Datastar include:

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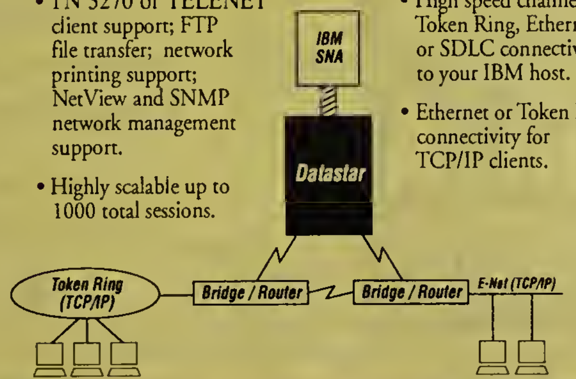

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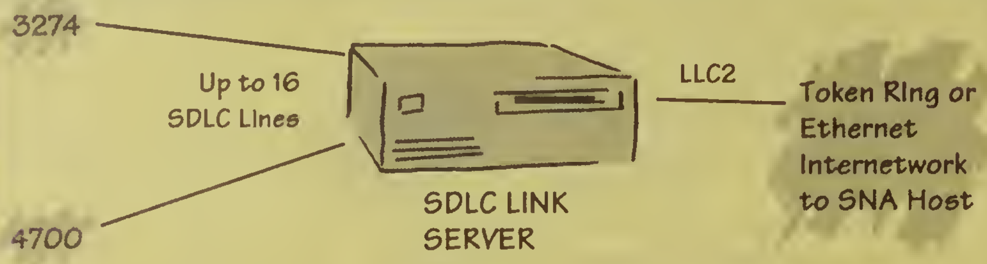

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DATA RACE Announces Multiplexer Breakthrough

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By Paul Longoria

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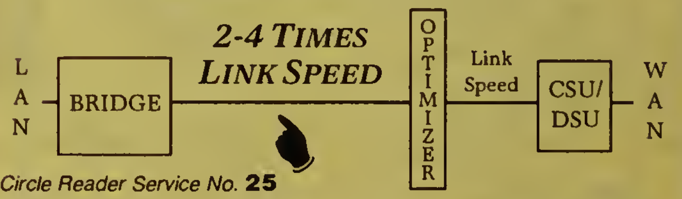

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Title...

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Division/Department...

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City.. State............. Zip...................

Is this your Business Address? **Yes** ☐ **No** ☐
Please Answer ALL Questions, Sign and Date the Form.

1 Industry: (check one only)

- 01. ☐ Manufacturers (other than Computer/Communications)
- 02. ☐ Finance/Banking
- 03. ☐ Insurance
- 04. ☐ Real Estate
- 05. ☐ Healthcare Services
- 06. ☐ Legal
- 07. ☐ Hospitality
- 08. ☐ Retail/Wholesale Trade/Business Services
- 09. ☐ Transportation
- 10. ☐ Utilities
- 11. ☐ Education
- 12. ☐ Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry)
- 13. ☐ Government, State/Local
- 14. ☐ Government, Federal
- 15. ☐ Military
- 16. ☐ Aerospace
- 17. ☐ Consultants (Independent)
- 18. ☐ Carriers
- 19. ☐ Interconnects
- 20. ☐ Manufacturers (Computer/Communications)
- 21. ☐ VAR/VAD/VAN/ Systems Houses
- 22. ☐ Distributors, Computer Related
- 23. ☐ Distributors, Communications Related
- 24. ☐ Other________________________________

2 What is your job function? (check one only)

NETWORKING MANAGEMENT

- 1. ☐ Networking Mgmt.
- 2. ☐ LAN Mgmt.
- 3. ☐ Datacom/Telecom Mgmt.
- 4. ☐ Engineering Mgmt.

MIS MANAGEMENT

- 5. ☐ MIS, IS, IT Mgmt.
- 6. ☐ Engineering Mgmt.

CORPORATE MANAGEMENT

- 7. ☐ Corporate Mgmt. (CIO, CEO, Pres., VP, Dir., Mgr., Financial Mgmt.)
- 8. ☐ Consultant (Independent)
- 9. ☐ Other________________________________

3 My responsibilities include: (check one only)

- 1. ☐ LANs/ Internetworking/ WANs
- 2. ☐ LANs/ Internetworking
- 3. ☐ LANs
- 4. ☐ WANs
- 5. ☐ None

4 What is the total number of sites for which you have purchase influence? (check one only)

- 1. ☐ 100+
- 2. ☐ 50 - 99
- 3. ☐ 20 - 49
- 4. ☐ 10 - 19
- 5. ☐ 2 - 9.
- 6. ☐ 1
- 7. ☐ None

5 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. Scope
(check one only)

- 1. ☐ Corporatewide
- 2. ☐ Multienterprise (consultants)
- 3. ☐ Departmental

B. Involvement
(check all that apply)

- 1. ☐ Recommend/Specify
- 2. ☐ Approve
- 3. ☐ Evaluate

4. ☐ None (A or B)

6 Check all that apply in Columns A and B:

A: I am involved in the purchase of the following products/services.
B: I plan to purchase the following products/services in the next year.

Involved A / Plan to Purchase B

LOCAL-AREA NETWORKS

- ☐ 01. ☐ Local-Area Networks
- ☐ 02. ☐ LAN Servers
- ☐ 03. ☐ LAN Operating Systems Software
- ☐ 04. ☐ Superservers
- ☐ 05. ☐ Data Base Servers (Oracle, Sybase, etc).
- ☐ 06. ☐ Terminal Servers
- ☐ 07. ☐ LAN Services
- ☐ 08. ☐ LAN Storage Devices (optical, tape, disk, etc,. including backup systems)
- ☐ 09. ☐ Network Test Equipment
- ☐ 10. ☐ Hubs
- ☐ 11. ☐ Cables, Connectors, Baluns
- ☐ 12. ☐ UPS
- ☐ 13. ☐ Network Adapter Boards
- ☐ 14. ☐ Peer-to-Peer LANs
- ☐ 15. ☐ Wireless LANs
- ☐ 16. ☐ SNMP Network Management
- ☐ 17. ☐ ATM (Asynchronous Transfer Mode)

A B **INTERNETWORKING**

- ☐ 18. ☐ Bridges
- ☐ 19. ☐ Routers
- ☐ 20. ☐ Gateways
- ☐ 21. ☐ Bridge/Routers
- ☐ 22. ☐ Hubs
- ☐ 23. ☐ Intelligent Hubs
- ☐ 24. ☐ Communications Servers

Involved A / Plan to Purchase B

COMPUTERS/PERIPHERALS

- ☐ 25. ☐ Micros/PCs
- ☐ 26. ☐ Minis
- ☐ 27. ☐ Mainframes
- ☐ 28. ☐ Pen-Based
- ☐ 29. ☐ Laptops
- ☐ 30. ☐ Workstations
- ☐ 31. ☐ Image Processing Workstations
- ☐ 32. ☐ Front-End Processors
- ☐ 33. ☐ Terminals
- ☐ 34. ☐ Printers
- ☐ 35. ☐ Cluster Controllers
- ☐ 36. ☐ Fax Machines
- ☐ 37. ☐ X-Terminals

A B **SOFTWARE/APPLICATIONS**

- ☐ 38. ☐ Network Management
- ☐ 39. ☐ Micro to Mainframe
- ☐ 40. ☐ Security
- ☐ 41. ☐ Communication/Terminal Emulation
- ☐ 42. ☐ Word Processing
- ☐ 43. ☐ Operating Systems
- ☐ 44. ☐ Business Applications (Finance/Mfg/HR)
- ☐ 45. ☐ Applications Development
- ☐ 46. ☐ Data Base Management
- ☐ 47. ☐ Spreadsheet
- ☐ 48. ☐ Groupware
- ☐ 49. ☐ EDI
- ☐ 50. ☐ E-Mail
- ☐ 51. ☐ Windows/Graphical User Interface
- ☐ 52. ☐ 4GL/Development
- ☐ 53. ☐ Multimedia
- ☐ 54. ☐ Graphics
- ☐ 55. ☐ Utilities

A B **WIDE-AREA NETWORK EQUIPMENT/SERVICES**

- ☐ 56. ☐ Modems (9.6K bps and over)
- ☐ 57. ☐ Modems (under 9.6K bps)
- ☐ 58. ☐ T-1
- ☐ 59. ☐ T-3
- ☐ 60. ☐ Fractional T-1
- ☐ 61. ☐ Data Switches
- ☐ 62. ☐ SMDS
- ☐ 63. ☐ ATM (Asynchronous Transfer Mode)
- ☐ 64. ☐ Matrix Switches
- ☐ 65. ☐ Packet Switches
- ☐ 66. ☐ Protocol Converters
- ☐ 67. ☐ Diagnostic/Test Equipment
- ☐ 68. ☐ DSU/CSUs
- ☐ 69. ☐ Microwave
- ☐ 70. ☐ Fax Boards/Modems
- ☐ 71. ☐ VSAT
- ☐ 72. ☐ Fiber Optic
- ☐ 73. ☐ Satellite
- ☐ 74. ☐ ISDN
- ☐ 75. ☐ PBXs (over 1000 lines)
- ☐ 76. ☐ PBXs (under 1000 lines)
- ☐ 77. ☐ Automatic Call Distributors
- ☐ 78. ☐ Voice Messaging Systems
- ☐ 79. ☐ Videoconferencing Systems
- ☐ 80. ☐ Voice Response/Processing
- ☐ 81. ☐ Switched Voice
- ☐ 82. ☐ Dedicated Leased Line
- ☐ 83. ☐ Switched Data
- ☐ 84. ☐ Centrex
- ☐ 85. ☐ E-Mail/On-Line Information
- ☐ 86. ☐ Image Processing
- ☐ 87. ☐ Audio Teleconferencing
- ☐ 88. ☐ Local Services
- ☐ 89. ☐ WATS MTs
- ☐ 90. ☐ International
- ☐ 91. ☐ Virtual Networks
- ☐ 92. ☐ Frame Relay
- ☐ 93. ☐ Value Added Services
- ☐ XX ☐ None of the above (1-93)

7 What is the total number of A: LANs B: Workstations/Nodes in your entire organization?

	LANs A		Workstations/ Nodes B
1.	☐	5,000+	☐
2.	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐
4.	☐	50 - 99	☐
5.	☐	10 - 49	☐
6.	☐	9 or Less	☐

8 Which of the following network platforms are currently installed/planned in the next year?

NETWORK ARCHITECTURES
Present Planned

- ☐ 01. ☐ SNA
- ☐ 02. ☐ DECNET
- ☐ 03. ☐ MAP/TOP
- ☐ 04. ☐ TCP/IP
- ☐ 05. ☐ DCA (Unisys)
- ☐ 06. ☐ X.25

Present Planned

- ☐ 07. ☐ NOVELL IPX/SPX
- ☐ 08. ☐ APPC/APPN/LU 6.2
- ☐ 09. ☐ NETBIOS
- ☐ 10. ☐ OSI
- ☐ 11. ☐ APPLETALK
- ☐ 12. ☐ OTHER________________________

LAN OPERATING SYSTEM

- ☐ 13. ☐ LOCALTALK (APPLETALK)
- ☐ 14. ☐ BANYAN (VINES)
- ☐ 15. ☐ DCA (IRMALAN)
- ☐ 16. ☐ DCA (10-NET)
- ☐ 17. ☐ IBM (LAN SERVER)
- ☐ 18. ☐ IBM (PC LAN PROGRAM)
- ☐ 19. ☐ MICROSOFT (LAN MANAGER)
- ☐ 20. ☐ UNGERMANN-BASS (NET/1)
- ☐ 21. ☐ NOVELL (NETWARE, 2.X, 3.X, 4.X)
- ☐ 22. ☐ PROTEON (PRONET)
- ☐ 23. ☐ SITKA (TOPS)
- ☐ 24. ☐ 3COM (3+, 3+OPEN)
- ☐ 25. ☐ ARTISOFT (LANTASTIC)
- ☐ 26. ☐ HAYES (LANSTEP)
- ☐ 27. ☐ DEC (PATHWORKS)
- ☐ 28. ☐ OTHER________________________

LAN ENVIRONMENT

- ☐ 29. ☐ 4M TOKEN RING
- ☐ 30. ☐ 16M TOKEN RING
- ☐ 31. ☐ ARCNET
- ☐ 32. ☐ ETHERNET
- ☐ 33. ☐ STARLAN
- ☐ 34. ☐ FDDI
- ☐ 35. ☐ LOCALTALK
- ☐ 36. ☐ 10BASE-T
- ☐ 37. ☐ OTHER________________________

OPERATING SYSTEM

- ☐ 38. ☐ DOS
- ☐ 39. ☐ UNIX/XENIX/AIX
- ☐ 40. ☐ OS/2
- ☐ 41. ☐ OS/2 2.X
- ☐ 42. ☐ MVS
- ☐ 43. ☐ VM
- ☐ 44. ☐ VMS
- ☐ 45. ☐ MACINTOSH
- ☐ 46. ☐ WINDOWS
- N/A 47. ☐ WINDOWS NT
- ☐ 48. ☐ X WINDOWS
- ☐ 49. ☐ OTHER________________________

9 For which areas outside of the U.S. do you have purchase influence? (check all that apply)

- 1. ☐ Europe
- 2. ☐ Asia
- 3. ☐ South America
- 4. ☐ Australia
- 5. ☐ Middle East
- 6. ☐ None

10 Which of the following hardware platforms is installed/planned in your company? (check all that apply)

	Mainframes Currently Installed	Planned Next Year	Minis Currently Installed	Planned Next Year
01. DEC	☐	☐	☐	☐
02. IBM	☐	☐	☐	☐
03. AMDAHL	☐	☐	☐	☐
04. AT&T	☐	☐	☐	☐
05. BULL HNIS	☐	☐	☐	☐
06. DATA GENERAL	☐	☐	☐	☐
07. HP	☐	☐	☐	☐
08. TANDEM	☐	☐	☐	☐
09. UNISYS	☐	☐	☐	☐
10. OTHER______________	☐	☐	☐	☐

MICROCOMPUTERS
(fill in the numbers)

	NUMBER INSTALLED	NUMBER PLANNED NEXT YEAR
11. MACINTOSH 20, 30, 40		
12. MACINTOSH OTHER		
13. PCs BASED ON 80586	N/A	
14. PCs BASED ON 80486		
15. PCs BASED ON 80386		
16. PCs BASED ON 80286		
17. PCs BASED ON 8086/8088		
18. RISC / UNIX BASED WKSTNS		
19. OTHER		

11 Estimated value of networking equipment and services:

A. Which you helped specify, recommended or approved in the last year?
B. Which you plan to help specify, recommend or approve in the next year?

A		B	
☐	1.	☐	$100 million and over
☐	2.	☐	$50 - $99.9 million
☐	3.	☐	$25 - $49.9 million
☐	4.	☐	$20 - $24.9 million
☐	5.	☐	$10 - $19.9 million
☐	6.	☐	$5 - $9.9 million
☐	7.	☐	$1 - $4.9 million
☐	8.	☐	$500,000 - $999,999
☐	9.	☐	$499,999 or less

12 Estimated gross annual revenue of your entire company/institution: (check one only)

- 1. ☐ Over $10 billion
- 2. ☐ $1 to $9.9 billion
- 3. ☐ $500 to $999.9 million
- 4. ☐ $100 to $499.9 million
- 5. ☐ $50 to $99.9 million
- 6. ☐ $10 to $49.9 million
- 7. ☐ $5 to $9.9 million
- 8. ☐ $4.9 million or less

13 Estimated number of employees for your entire corporation:

- 1. ☐ Over 10,000
- 2. ☐ 5,000 - 9,999
- 3. ☐ 2,500 - 4,999
- 4. ☐ 1,000 - 2,499
- 5. ☐ 500 - 999
- 6. ☐ 499 or less

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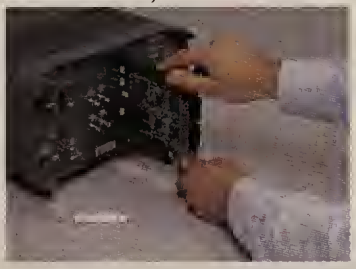

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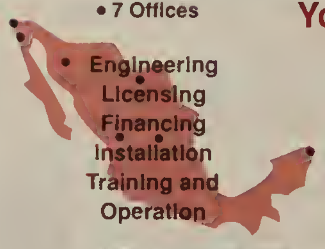

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FCC chief Sikes resigns

continued from page 2

network services under Open Network Architecture (ONA) — has been a mixed blessing for users, according to some.

According to the lawyers who represent business users at the FCC, Sikes, an attorney himself, earns high marks for such actions as the recent FCC order requiring the RBHCs to collocate competitors' equipment (see graphic, this page), support for AT&T Tariff 12 discount packages and the August 1991 ruling allowing AT&T to file contracts for business customers.

PHOTO ©1992 WALTER CALAHAN
Alfred Sikes

"His continuing support for Tariff 12 services has yielded enormous savings to the American business community," said Jim Blaszak, an attorney for the Ad Hoc Telecommunications Users Committee. And in testimony to Sikes' knack for compromise, even the microwave users — who will be pushed from their radio spectrum to make room for PCS under Sikes' new technology initiative — had kind things to say about the departing chairman.

"I think a reasonable accommodation has been made," said Sean Stokes, an attorney with the Utility Telecommunications Council. "We're looking at the opportunity PCS might provide to large radio users themselves."

Sikes' willingness to compromise also had its down sides, observers said. "The bad news is that the commission, in the minds of large users, frequently found itself compromising away substantial progress in the effort to get everyone aboard," said Morrison & Foerster attorney Hank Levine, who fights for banking industry clients at the FCC.

The ONA proceeding to get the Bells to unbundle network services in exchange for greater freedom in marketing information services is a case in point, he said. ONA has been unsuccessful because a competitive level of unbundling was never achieved.

But price caps has been an area where compromise worked to users' advantage, Levine noted. The original FCC price cap formula for the RBHCs has been watered down enough so that no drastic changes followed the previous rate-of-return regulation. Also, Sikes garnered praise for his role in the international arena. Under his watch, the FCC strived to develop better contacts with foreign carriers and their governments while advocating the end of monopoly control and lower international accounting rates. And the FCC played a strong role as part of the U.S. team from government and industry at the World Administrative Radio Conference, where the U.S. won spectrum reallocation for low-earth orbit satellites.

While it's unknown who the Clinton administration will appoint as Sikes' successor, the names of attorney Tom Casey from the law firm of Skadden, Arps as well as Bill Squadron, the current New York commissioner of telecommunications, are being bandied.

Landmark FCC decisions during Sikes' reign

May 1990	Conditionally approves local exchange carrier (LEC) plans for Open Network Architecture (ONA).
Oct. 1990	Establishes price caps for LECs.
June 1991	Sets ONA tariff structure.
Aug. 1991	Allows AT&T to file custom deals under new contract-carriage rules. Presses RBHCs to support key 800-portability technology within 18 months.
Jan. 1992	Proposes reserved spectrum for emerging technologies, such as personal communications service (PCS). Plans to move microwave users from the 1.8-GHz to 2.2-GHz bands.
April, 1992	Allows users to modify their existing Tariff 12 contracts, reversing earlier order.
July 1992	Proposes more definitive regulatory, licensing and spectrum reallocation schemes for PCS.
July 1992	Permits RBHCs to provide video transmission services but prohibits them from originating programming.
Aug. 1992	Proposes allocating spectrum for low-earth orbit satellites.
Sept. 1992	Requires LECs to co-locate competitors' equipment. Permits alternative carriers to compete for private-line access to interexchange carriers.
Nov. 1992	Delays 800 portability until May 1993.

GRAPHIC BY TERRI MITCHELL SOURCE: *NETWORK WORLD*

Users take aim at Clinton transition team choice

WASHINGTON, D.C. — The Clinton administration's apparent choice to head the Democratic transition team for network issues faces opposition from public interest groups that claim he champions business interests over consumers' needs.

Ronald Plesser came under fire last week from several groups, including the Computer Professionals for Social Responsibility (CPSR) and the Taxpayer Assets Project, that oppose his appointment as deputy director of the science and technology group during the transition.

Plesser is an attorney with the Baltimore-based law firm Piper & Marbury, whose clients include the Direct Marketing Association and the Information Industry Association (IIA), a trade group representing high-technology companies.

The groups, which are drawing up a petition against his appointment, say they do not want Plesser choosing a course for the Federal Communications Commission or recommending the future FCC chairman.

James Love, director of the Taxpayer Assets Project, noted that Plesser — on behalf of the IIA — opposed legislation that would have allowed consumers direct network access to government databases through the Government Printing Office.

The IIA and the Bush administration oppose the legislation because of concerns that cheap access to government databases would undercut the private sector's role in providing on-line services. Proponents of the plan say consumers have a right to access federal information collected at taxpayers' expense.

"He's a counsel for the IIA and a lobbyist for Mead Data, Inc.," Love said. "It's hard to imagine how he will avoid a conflict of interest."

Marc Rothenberg, director of the CPSR, said Plesser's opinions too closely reflect the interests of his clients, who don't want the U.S. to adopt policies reflecting the individual right to privacy in net usage.

"Virtually every other country is developing privacy principles in new services," he said. "When I asked Ron what he would advise the president on privacy, he said he didn't think it was an important issue."

The Clinton transition staff would neither confirm nor deny Plesser's appointment.

— *Ellen Messmer*

Users, carriers in tug-of-war

continued from page 1

promotes the service. "SVCs could tremendously expand use of frame relay for intercompany communications."

Users' view

John Robinson, manager of data communications at R.R. Donnelley & Sons Co. in Chicago, told attendees at a recent Frame Relay Forum meeting that his firm has identified the lack of SVCs as a major disadvantage to frame relay.

Robinson's firm had hoped to consolidate five networks into a fully meshed frame relay net supporting multiple protocols. The lack of SVCs has made it difficult for R.R. Donnelley to extend its network to smaller sites.

Tom Hynd, vice-president and manager of network services for J.P. Morgan & Company, Inc. in New York, said his firm would likely use SVCs for intercompany networking and has begun asking carriers about their SVC plans.

"There is definitely substantial user demand for SVCs," said Katheryn Korostoff, a principal consultant with Strategic Network Consulting, Inc. in Rockland, Mass.

"The carriers should take a closer look at the needs of frame relay customers," she said. "They'll find that SVCs are important to those users, especially [those] with large networks."

Korostoff contends that the service is also key to wooing X.25 users to frame relay because SVCs are already a staple in X.25 nets. "Moving from X.25 to PVCs is a step back," she said.

There are a number of reasons why carriers are slow to support SVCs, according to analysts.

"They just made a huge investment in PVC networks and are not real anxious to implement the next phase," said Laura Capaldini, founder of Northpoint Consulting, a Reston, Va., consulting firm, and a former frame relay product manager at Sprint. "The PVC network has got to prove in [first]."

Some suggest carriers may be slow to offer SVCs because they stand to lose money if PVC users move to less expensive SVCs, while others say SVCs will spur greater usage of frame relay and result in more carrier revenues.

IBM releases new software

continued from page 2

between the systems.

"Once thought of primarily as application platforms, mainframes are now being leveraged as servers," said Gerry Machi, vice-president and general manager of Novell's NetWare Systems Group in Sunnyvale, Calif.

According to analysts, LANRES is a perfect example of a product designed to extend the life of a mainframe as more companies move to personal computer-based systems.

The new versions of LANRES, like the earlier ones, include software components for IBM mainframes and NetWare 3.X servers. They provide four basic functions: print services, disk services, data distribution and central administration.

The print services and central administration capabilities are new to the LANRES/MVS version, while the disk services and data distribution capabilities are new to both versions.

Print services let a user on a NetWare 3.X LAN send a document to a printer attached to an IBM host and vice versa, while disk services let NetWare users access mainframe-based direct-access storage devices for additional storage capacity, according to Patricia Hume, client/server system/product manager at IBM's Enterprise Systems division here.

Disk services also let users share data across an enterprise net since the mainframe storage can act as a central data repository, Hume said.

Data distribution lets users upload or download files to and from the host, while central administration lets managers perform basic tasks on all NetWare 3.X servers from a utility provided by LANRES on the IBM host.

"It used to be a real hassle to get [a file] from the mainframe," said Ron Peri, chairman and chief executive officer at Computer Support of North America, a systems integrator in East Hannover, N.J. "Now you get direct access to mainframe files."

According to Peri, more significant than the new disk server and file-transfer capabilities are the products' new communications capabilities.

Before this release, both versions of LANRES required a direct channel connection from the NetWare server to the host. Now customers can use TCP/IP or SNA to connect the two over an enterprise backbone using IBM's LU 6.2 peer-to-peer protocol. "The range of [connectivity] options really helps customers protect their investments," Hume said.

LANRES/MVS 1.2 and LANRES/VM 1.2 will be available in March. The products have a onetime price of $12,600 or a monthly license fee of $262 per LAN server for both software pieces, regardless of how many PCs are in the work group.

Carriers figure they have little to lose by not offering SVCs based on their contention that there is no demand for them.

Of the five frame relay carriers interviewed by *Network World* for this story, only BT had announced plans for SVCs, which it planned to offer this month. However, BT last week postponed delivery of the feature because its switch and router suppliers have not yet upgraded their wares to support it.

"SVCs are the key to the success of frame relay," said John Coons, BT's director of network product management. "We had hoped that our switch providers had supported SVCs, but all we can do now is wait."

It could be a long wait, as BT's switch supplier is StrataCom, Inc., which has no near-term plans to upgrade its switches to support SVCs. Other carriers, including WilTel, AT&T and CompuServe, Inc., also use StrataCom switches.

Andrew Greenfield, frame relay product manager for StrataCom, said there is no user demand for SVCs and stressed that router vendors need to equip their devices to support the feature, too.

"We can't do all this alone," he said. Router vendors need to equip their devices to support the CCITT Integrated Q.933 Services Digital Network signaling standard, which is used to establish SVCs.

Officials from WilTel, AT&T and MCI Communications Corp. all agreed with Greenfield's contention that there is no demand for SVCs and said they will not support the service until there is such support.

"We've heard from a few users, but they aren't saying they've got to have SVCs soon," said Kaye Hack, product manager for WilTel's WilPak offering. "They're asking us to focus on items such as sustained bursts, 19.2K- and 9.6K-bit PVCs and international frame relay."

The Frame Relay Forum apparently anticipates that demand will grow and has given SVCs a high priority, said Rajiv Kapoor, chairman of the forum's technical subcommittee. The forum hopes to have an SVC implementation agreement set by the first quarter of 1993 that will pave the way for interoperable SVC services, he added.

Sprint slips 800 feature by AT&T

continued from page 1

that will hold an early edge over its rivals with SiteRP — an edge it hopes to use to land new 800 customers as the date for 800 portability approaches.

"This is a fabulous step forward for 800 users," said Bryan Van Dussen, a senior analyst with The Yankee Group, a Boston consulting and research firm. "Letting the user control and manipulate the call processing power of a carrier's net is new ground."

The routing feature can be used with a range of toll-free services, including Sprint's high-end Ultra800 service, its mid-range Clarity offering and its low-end FONLine 800 service. Sprint said SiteRP can work with any automatic call distributor (ACD).

SiteRP works very much like AT&T's ICP ("AT&T opens SS7 net for 800 routing," *NW,* Dec. 7). Sprint provides an application that customers load onto one of their machines. The systems are tied into Sprint's Signaling System 7 (SS7) net via a direct 56K bit/sec X.25 link.

When a caller dials a toll-free number, the switch at the originating end holds the call while the SS7 network queries the customer's SiteRP for information on how to route the call. Using control information continually received from ACDs, SiteRP determines which location should handle the call and then forwards the telephone number for that site to the originating switch.

This will enable users to dynamically route calls to the first available agent at any call center. Default routing options are maintained in case the on-site computer fails to respond within roughly half of a second or upon receipt of an erroneous message.

SiteRP also gives users more flexibility in performing load balancing among multiple call centers and improves customer service by answering incoming calls faster. Additionally, users can reduce staff while increasing agent productivity.

Advantis has used SiteRP to reroute calls among 10 of its catalog ordering centers across the nation and is pleased with the advanced 800 feature. Ed Bonkwoski, a senior communications analyst for Advantis, credits SiteRP with enabling its agents to answer most calls after only one ring and assuring that few, if any, callers have to wait more than 30 seconds to speak to an agent.

SiteRP costs $6,000 per site per month and carries a $100 change charge, compared to AT&T's ICP monthly charge of $4,000 for each SS7 Network Control Point link and $50 change fee. AT&T also charges users a onetime $5,000 installation fee per Network Control Point pair, while Sprint charges twice that amount.

The carrier will roll out a second method of routing calls on a call-by-call basis by mid-1993. With the second option, firms can use Sprint's Insite net management terminal instead of a special on-site processor.

In this scenario, users will need a 56K bit/sec link between its Sprint Insight net management terminal and the computer in the Sprint network, as well as dedicated links to tie each ACD or ACD management system directly to the Sprint processor.

This setup will enable users to avoid the cost of the SiteRP processor but will require them to pay for at least two 56K bit/sec links. With this approach, users upload routing tables and other data to the carrier processor so that Sprint can reroute the calls for the user.

Buyout moves SMC to hub mart

continued from page 4

internetwork vendors, such as 3Com Corp., said Geof Karlin, vice-president of marketing for SMC's System Products Division.

SMC is ranked by most market researchers second only to 3Com in the Ethernet adapter card market, a position obtained largely via SMC's acquisition of Western Digital Corp.'s LAN business last year. SMC, which expects revenue of about $260 million for its 1993 fiscal year, also sells Ethernet work group hubs, as well as token-ring cards and hubs.

SMC plans to develop a midrange line of hubs and line of routers based on Sigma's technology, Karlin said.

Sigma will benefit from SMC's wider name recognition, distribution channels, deep pockets and semiconductor manufacturing capabilities, said Ashraf Dahod, Sigma's president.

The acquisition is expected to close by year end, at which time all Sigma products will carry the SMC brand name. Sigma's management will stay intact.

Cincom eyes new plan

continued from page 8

comes back on line, whether it is minutes, hours or days later. But with Transaction Partners, a failure at one node does not prevent other databases from completing the update and releasing their locks. By freeing databases to process the next transaction, the protocol supports greater transaction throughput and higher availability of data while still ensuring data concurrency.

Transaction Partners uses a peer-to-peer approach to two-phase commit, meaning each database logs information about the transaction's status and which databases are involved. This gives each database the information needed to complete a distributed transaction. In contrast, regular two-phase commit designates one database to log all relevant information and manage the actions of the databases during each transaction phase.

With Transaction Partners, a database node that fails in the middle of a transaction consults its log to determine which databases participated in the transaction. It then finds out whether any of the participating databases completed their updates. If any did, the failed database immediately completes its update and releases its locks.

If none of the participating databases completed the transaction, the restarted database assumes the transaction was aborted and rolls back the update.

NETWORK WORLD

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161 Worcester Road
Framingham, Mass. 01701-9172
(508) 875-6400

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